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Mathematics achievement in the transition from
intermediate school to high school.

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Abstract

This study investigates the nature and level of communication between the primary and intermediate schools and the high schools in relation to student achievement. It also investigates how information relating to mathematics achievement is passed between the schools and makes some suggestions to improve the current situation.

Four high schools, three intermediate schools and three full primary schools were identified for the study and a survey was conducted of two teachers in each of these schools identify what happens in these schools in relation to the transition of students from Form 2 to Form 3.

It was found that there were significant differences in the ways that schools on either side of the transition viewed and implemented the National Curriculum in Mathematics. The primary and intermediate schools were much more enthusiastic about the National Curriculum than the high schools. As a consequence it was found that the primary and intermediate schools have made considerable progress toward reporting student progress against the objectives of the curriculum and were able to determine levels of achievement in each strand.

It was found that primary and intermediate schools are moving away from the “Primary Progress Record, Senior School” (known as the blue record card) as the main means of handing information about student achievement on to the high schools. Many schools are developing their own “profile” or progress sheets as a way of better tracking student progress and therefore are more able to accurately indicate where the student is when they enter high school.

The high schools have generally not been using this information as a basis for their third form programmes. They report that there is a large variation in the quality and quantity of the information which comes from their provider schools and in many cases would

prefer a single document which gave a general idea of student ability. The high schools were therefore placing students in classes on general ability, gained by enrolling staff, or on entrance tests which they developed.

The high schools were much less enthusiastic about measuring against the objectives of the curriculum and were able to present a number of reasons for their reluctance. There is therefore a need to develop a model for communicating student achievement across the transition into high school.

It was found that many of the high school teachers did not value the information provided by the primary and intermediate schools because they had no part in determining what information should be collected and how it could be used. Revising the data collection process, involving the teachers who could potentially use the information, would be one way of overcoming this.

Results of this study show that there is a need for teachers to be more aware of the practises of schools on the other side of the transition.

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Chapter 1 - Introduction

1.1 Background

For most students the transition into high school occurs at a significant time in their lives. Concurrently the students are experiencing physiological changes, establishing their own identity and facing the challenge of starting at the bottom of a generally much larger high school. Recent curriculum initiatives in New Zealand have recognised these factors and, in an attempt to minimise the students learning, have developed curriculum statements which span all pre-tertiary education. This research investigates what happens at the transition into high school in relation to students mathematical learning.

1.2 Structures in New Zealand schools

Schools in New Zealand are classified in various ways. Class levels within the schools are indicated by titles which differ from common international usage, although there has been a move to indicate class levels by the number of years at school. Table 1 indicates the different school and class titles.

School Type	Class Names	Years
Primary	Junior 1 – 2	1 – 2
	Standard 1 – 4	3 – 6
Full Primary	Junior 1 – 2	1 – 2
	Standard 1 – 4	3 – 6
	Form 1 – 2	7 – 8
Intermediate	Form 1 – 2	7 – 8
Middle	Form 1 – 4	7 – 10
High	Form 3 – 7	9 – 13
Area	Junior 1 – 2	1 – 2
	Standard 1 – 4	3 – 6
	Form 1 – 7	7 – 13

Table 1 – New Zealand School Structures

As the transition from “forms” to “years” has not been completely implemented nationally, for the purposes of this research any reference to school years will be made to the “forms”, in particular, form 2 and form 3. However reference to secondary education overseas is equivalent to high school education in New Zealand.

1.3 The New Zealand curriculum framework

Mathematics Education in New Zealand schools has undergone major change in recent years. The curriculum statement in mathematics, as with all other statements, has generally followed the school boundaries. Traditionally there have been three quite distinct groupings of curricula.

With the intention of updating and standardising school curricula in 1991 the government stated that its aim was to “set out a framework for the total school programme” (Ministry of Education, 1991 page 1). In order to facilitate this, the entire

school curriculum (from year 1 to year 13) has been divided into 7 Essential Learning Areas. National curriculum statements have been, or are being developed, in each of these learning areas: Language and Languages, Mathematics, Science, Technology, Social Sciences, The Arts, and Health and Physical Well-being.

The curriculum in each learning area was developed to cover year 1 to year 13 and include 8 levels of achievement. It was envisaged that within this concept the distinctions made by the physical environment and the chronological year level would become less significant in determining the appropriate level at which a student should be working. This has subsequently been called a 'seamless curriculum' which runs contiguously through all pre-tertiary education. Additionally the various aspects of each learning area have been called strands. In mathematics the strands are Algebra, Geometry, Mathematical Processes, Measurement, Number and Statistics. The number of strands varies from learning area to learning area. In mathematics not all strands cover all 8 levels. The Number strand finishes at level 6, while the emphasis of the Measurement strand changes to Measurement and Calculus in levels 7 and 8. The distinction between the strands is not precise as there is a great deal of overlap in the content and approach in teaching between the strands. The Mathematical Processes strand runs through each of the other five strands and provides the mechanism for students to gain higher order cognitive processes.

As the process of updating and standardising curricula, which applies to all the learning areas, represents quite a major overhaul of existing curricula, it was anticipated that there may need to be some fine tuning of each curriculum statement. Therefore a draft curriculum would be published, revisions made and final curriculum statements in each essential learning area. At present not all the essential learning areas have final curriculum statements, however the Mathematics in the New Zealand Curriculum has been implemented in schools for 4 years.

With the full implementation of the curriculum framework there are two important implications for teachers and learners.

It is important to recognise that students are individuals who learn at different rates and in different ways.

In any one class students may be working at a range of levels both in different learning areas and within a single learning area.

Ministry of Education, 1992, page 23

It is clear that if the intention of the curriculum is to be implemented then it is entirely possible that students on reaching high school will have a diverse range of achievements in each of the strands of mathematics. They might be operating at different levels and be progressing at different rates. These are dependent on activity, the curriculum area and the prior knowledge of the student.

In the first year of high school the teacher is faced with a group of students who have a large range of experiences and achievements. This is a consequence of a national curriculum which starts at primary school and ends at high school. Ideally students should be able to progress through the curricula at different rates. However this is a difficult for teachers to manage as highlighted by the Cockroft report :

It therefore seems that there is a 'seven year difference' in achieving an understanding of place value By this we mean that, whereas an 'average' can perform this task at age 11 but not at 10, there are some 14 year olds that cannot do it and some 7 year olds that can. Similar comparisons can be made in respect of other topics.

Cockroft, 1992 page 100

The report then states:

... the curriculum provided for pupils needs to take into account the wide gap in understanding and skill which can exist between children of the same age.

Cockroft, 1992 page 101

A number of students who enter high school have been exposed to high school mathematics and a significant proportion of students are still struggling with mathematics at a much lower level. If students are placed in a mixed ability situation, the teacher is expected to keep the able students interested, motivated and challenged while at the same time develop the skills of those who are less able. This will almost certainly guarantee students working at many levels in a classroom.

1.4 Transition to high school

The change from intermediate school to high school is at an age when the child's physical and social development causes its own traumas. The child leaves a home room situation where one teacher has a large pastoral input and moves to a more individualistic environment where they have contact with a large number of teachers. The school organisations and timetabling may be quite different and hence it is important for high school mathematics programmes to build on past achievement and success. This is only possible if a clear and accurate picture of the student's ability can be gained in the transition. Traditionally one way of doing this is by using the "Primary Progress Record, Senior School" form. This form will subsequently be referred to as the blue record card (because of its colour) and a copy is included as appendix 1. This card is updated annually (at least) by the primary and intermediate school teachers with a general statement by the form 2 teacher describing the characteristics of the student. The card is sent to the high school prior to the transfer. However there is a question as to the validity of these record cards because a number of schools are not using them. These schools are choosing to develop their own forms to better indicate student progress and achievement. There are also a number of high schools that seem to disregard them after initial placement of students into classes, thereby undervaluing their usefulness as a means of communication information between schools.

There is ample anecdotal evidence to suggest that the professional relationship between the high school teachers and their intermediate counterparts is not what it could or

should be. The intermediate school teachers often say they spend an inordinate amount of time preparing reports and profiles on their students and the high schools seem to completely ignore them. In some cases there is blatant distrust by the high schools for any material which comes from the intermediate schools and the reasons suggested include the lack of professional judgement and a history of inaccurate, inconsistent or non-existent reporting. This has in many cases led the high schools to devise their own entry assessments to determine the ability of their incoming third form cohort. This has caused its own set of problems, but whether the results are any more accurate than those supplied by the intermediate schools is yet to be determined. Additionally there is doubt as to whether these tests are related to the national curriculum and therefore how the high schools place students in classes is also questionable. This research aims to investigate what high schools do in terms of identifying at what level the students are when they enter the high school, as well as what information is handed over by the intermediate schools and how they correlate.

Critical to this research is the fact that this transition from intermediate to high school reflects a major change in style of education from a single class teacher with a multi-subject approach to specialist single subject teachers. Coincident with this are the changes from smaller to bigger schools where the child leaves the 'top' and starts at the 'bottom' and organisational differences. During this time the physical and social developments are often traumatic.

It is the intention of this research to find out how a cluster of 4 high schools, 3 intermediate schools and 3 full primary schools administer the curriculum framework and hence indicates the progression of students in relation to mathematical achievement.

1.5 The aims of the research

In particular this research aims to investigate:

1. The nature and the level of communication which exists between these schools in relation to student mathematical achievement?
2. How information is passed between the schools?
3. What could be done to improve the situation.?

Chapter 2 - Literature Review

This research is concerned specifically with the implementation of the Mathematics Curriculum in New Zealand schools. As the national curriculum has only been in place a relatively short period of time there has been insufficient time for substantial research in New Zealand relating to this curriculum document. However there are a number of international references which are related to specific issues discussed in this research. These are mentioned below.

2.1 Communication between schools

In one survey in England, Ginnever claims that less than one half of the schools consulted had joint meetings of teachers from contributing and receiving schools. He identifies five strategies for staff in dealing with the transfer. These are:

1. Record keeping – a tangible record of what the student can do
2. Easing the transfer – student visits the high school prior to transfer
3. Liaison discussions – between staff on both sides of the transition
4. Curriculum discussion – to enable the high school teachers to know what has been taught
5. Secondary feedback – essential if we are to achieve the best for the children.

Ginnever, 1986 pages 185 – 193

Teacher liaison is also identified by Gemmell as one of five parts of successful transition. These are:

1. Parental involvement
2. Teacher liaison
3. Pupil familiarisation
4. Ongoing programme for transition
5. Exchange of written information

Gemmell, 1986, pages 208 – 211

Lee, Harris & Dickson (1995) undertook extensive case studies in England to determine current practise in relation to transition into high school. In relation to the documentation between the schools they made a number of summary points:

1. The introduction of National Curriculum assessment appeared to have held up, in most cases, attempts to simplify and rationalise transfer documentation. National curriculum checklists and levels, although informative, did not often meet teachers' needs in the receiving school.
2. Records of achievement were approved of in principle by nearly all teachers, but receiving school teachers did not always find them useful because the volume of information was too great.
3. Teachers in receiving schools looked to the transfer documents for information to help with coursework planning, and although less of a priority, to check on pupils' attainment. They needed the first of these in advance of the new academic year in order to take action on it.
4. Teachers placed a high value on discussion with colleagues about pupils being transferred. It was often thought more informative than written records.
5. Where transfer documents included judgements about levels of performance, teachers in receiving schools were often unsure about the interpretation of criteria which underpinned them.

Lee, Harris & Dickson, 1995 pages 66-67

The Cockroft Report highlights the need for positive communication:

It is essential that there should be discussion between those who teach in primary and secondary schools in the same area and that such discussions should take place in an atmosphere of mutual professional respect. Both primary and secondary teachers need to take steps to acquaint themselves with the methods and materials which each uses.

Cockroft, 1982 page 125

In an address to the International Congress on Mathematical Education, Clarke (1992) concluded that:

Primary and secondary school teachers must become better informed about each others' beliefs and practices, so that each can implement an optimally effective mathematics program, with informed considerations of the others' practices.

Clarke, 1992 page 17

In New Zealand the lack of continuity between the primary and secondary systems was highlighted as early as 1962 in The Report of the Commission on Education in New Zealand.

McGee (1987) undertook to investigate the current practises by teachers relating to the transition from Form 2 to 3 in state schools, the factors which appear to be barriers and those which appear to promote effective linkages. He makes a number of strong recommendations for schools to improve their own linkage effectiveness These include:

1. Good communication between the principals of the high school and contributing school
2. Teachers of form 2 and form 3 are informed about the benefits of effective communication
3. Time allocation to staff and in-service time be used to implement effective programmes
4. Increased contact between primary and secondary associations
5. Primary and secondary inspectorates and advisory services coordinating their activities
6. Investigate the views of pupils and parents.

McGee, 1986, pages 222 – 224

2.2 Student placements

In the United States Calley and Seyfarth (1995, page 25) observe huge discrepancies between the expectations of the Standards (Curriculum and Evaluation Standards for School Mathematics - NCTM, 1989) and the current standardised tests used for entry into high schools. They claim that “norm-referenced standardised tests rarely reveal students understanding of concepts or how they think about mathematics”. They also note that the developers of these tests are modifying them to be more in line with the standards. They suggest that “support groups” among teachers to exchange ideas and experiences both with other schools and at different program levels would be helpful.

In New Zealand, McGee (1987) describes the process by which students are placed into classes based on the information gathered from a variety of forms.

It [the information] was used to place students in an appropriate third form class. Every school gave a lot of serious attention to this. Responsibility was usually delegated to the Third Form Dean or Guidance Counsellor, or a combination of the two. The rigid system of graded or streamed classes of the past has given way to a more flexible form of class organisation. In all schools students with serious learning difficulties were identified for special attention in work experience units.

McGee, 1987, page 190

2.3 PAT and TOSCA Tests

The Progressive Achievement Tests (PAT) were designed by the New Zealand Council for Educational Research (NZCER) and first implemented in 1969. These are a battery of nationally standardised tests of basic skills in reading, comprehension and mathematics. The tests are of the form of a pen and paper multiple choice type. They have been regularly checked and modified to ensure that reliability is maintained and that they generally match the current curriculum. The original aim was to provide an

indicator of general ability and also a method of identifying areas of student weakness, the current view is perhaps best summarised by the Education Review Office report, as being “designed to assess general skills and understanding rather than provide detailed diagnostic understanding”. (Education and Review Office, page 20). This reflects the current use as perceived by their reviewers.

It is common for primary and intermediate schools to administer these tests early in the year to gain a profile of the general ability of a year level cohort. This data seems to be used for a comparison to previous years and also as an aide to assist in placing students in classes (particularly in intermediate schools where streaming or banding is used). Similarly high schools are administering the tests early in the Form 3 year and in some cases the Form 4 years. The main purposes for its use seem to be identifying the appropriate level at which students should be working (particularly for schools that stream or band their students on ability) and also for providing an entry profile for the third form cohort. This profile is then used as a predictor of success at external examinations in forms 5 and 7, a process which is statistically suspect.

Since their inception PAT tests have been used extensively in New Zealand. Croft and Reid (1991, page 38) claim this to be up to three quarters of primary and up to half of junior secondary students. There is, however, a growing concern about the relevance of these tests and the validity of any conclusions which can be drawn from them. Some of the criticisms levelled at the tests include: its heavy use of reading, which will disadvantage students for whom the English language is not the first language; the disadvantaging of cultural groups - particularly Maori and Polynesian students by using questions with settings they may not be as familiar with; the claim that even with general revisions the mathematics tests are still not reflective of the current national curriculum content; the nature of the test (pen and paper) is not in line with the investigative and exploratory nature of the current curriculum.

Yet despite this there are a number of schools who have previously discarded PAT, are moving back to using it as an ability indicator of groups of students. The reason for this

may, in part, be the absence of any other nationally developed standardised test as an alternative.

NZCER has also developed a Test Of Scholastic Aptitude (TOSCA) as a means of providing information about the general ability of a group of students. This test is less useful to mathematics teachers as it only provides an indicator of general ability and not specific mathematics ability. Croft and Reid (1991, page 11) comment, that “it is the subject of considerable writing and debate” because of its general nature. Further in their analysis they found that the largest group of users of this test were the Guidance Counsellors and the reasons given were for student placement in classes (page 22).

2.4 Profiles and Portfolios

2.4.1 Introduction

The concept of a profile has been used in a number of contexts. It has been used in such a variety of ways that it is not possible to use the term universally to describe a single document. In each case a description of what is meant is required in order to clarify its use. In the New Zealand experience (section 2.4.3) the profile refers to a collection of student work, to reflect the best the student is capable of.

The terms profile and portfolio are defined for use in New Zealand. (Ministry of Education 1994, page 49) This helps to clarify the position as in many cases these terms are used interchangeably. Profile is defined as ‘A concise description ... of the achievement objectives or levels of achievement attained by a student, developed on the basis of a particular criteria.’ Portfolio is defined as ‘A collection of a variety of types of assignments, projects, reports, writings and test results which are personal to a student.’

It is suggested by Kuhs (1994, page 332) that profiles should be a collection of student work with a purpose. The teacher might limit the number of pieces and direct the

students to focus on particular learning outcomes. She claims that the process of developing profiles is as important as the profile itself in that the process encourages ongoing self review and indicates areas of strength and weakness. She then includes a rubric for evaluating portfolios which she calls a 'focused-holistic-scoring rubric' involving 5 levels and produces a single grade. It is the view of the researcher that grading a profile in this way seems to contradict the whole purpose of the profile. On the one hand the student collects his/her own work, improving, updating and modifying the collection and on the other hand knows that it is to be formally assessed by a rigorous rubric.

2.4.2 Overseas experiences

A more formal approach is taken by the Australian schools.

The mathematics profile is a framework for reporting student's mathematics achievements. It describes achievements in terms of learning outcomes, organised into eight levels, across six strands.

The outcomes in the mathematics profile are descriptions of the skills and knowledge that students acquire as they learn mathematics.

Olssen, Adams, Grace & Anderson, 1994, pages 7 & 9

Another view of the Australian profile from OECD is:

A profile is a description of the progression in learning outcomes typically achieved by students during the years of schooling in a particular learning area.

OECD, 1995, page 36

The profile describes the curriculum detail at the level the student is working at. It also allows for annotated samples of work to be included to provide evidence of student

achievement of the outcomes. As the profile in Australia is a year 5 to 10 project, it is expected that the profiles developed in the primary schools are forwarded to the high school with the students.

The profile is also discussed in relation to the passing information from teacher to teacher.

Many of the discontinuities in students' mathematical learning can be diminished through teachers at the various interfaces of schooling, and from class to class within a school, establishing some collective understanding of what is important in mathematics education and what progress has been made by individual students. The mathematics profile, through its overall structure and its description of intended learning outcomes, is an ideal vehicle for supporting this growth in collective understanding.

Olssen, Adams, Grace & Anderson, 1994, page 132

However the implementation of the profiles has not been in operation sufficient time to allow effective analysis of this transition.

In England, Johnson, Hill and Tunstall (1992, page 6) describe a profile as a student portfolio which goes home with the student at the end of each year, and a teacher profile folder which is a record of individual achievement and progress, written and retained by the teacher. Samples of work can be transferred from the portfolio to the profile and the profile forms the basis of the record of achievement which is then handed on to the high school. In relation to the transition, they say emphasis must be placed on two way communication with the high schools providing feedback to the primary schools on the transition process.

These records of achievements as a means of reporting student progress, are legally required in England since the introduction of the national curriculum according to Mitchell and Koshy (1993, page 97). They describe this as a folder including various

assessments of the child's work, skills, abilities and personal qualities and forms the basis for a summary report which is needed each year. They describe a particular school where the record of achievement has three parts: the admission, medical and family records; the formative and summative assessment records; and a portfolio (an A4 ring binder) which is maintained by the student. All three parts go with the student.

However if the portfolio is an A4 ring binder, and if each student generated such a folder to be forwarded to the high school, this may pose a problem for storage space particularly for schools where the form 3 intake was large. In addition the fact that each student maintains a folder suggests that it would have a large number of wide ranging tasks. To process each of these would require time and as some of the content might have come from several years previous there is a question of the appropriateness of the collection of this type of student work to forward to the high school.

A different approach is taken by Ayres et. al. (1993) also in England. They define profiles as "a means of recording and collating teachers' perceptions of primary and secondary school pupils". They go on to add that their primary purpose is "to form the basis for any action plan or intervention involving pupils" (page 6). In this context the profile is being used as a means of monitoring behaviour and the proforma secondary assessment profile sheet illustrates this. There are 20 categories to be graded (with some descriptors) on a 1 to 5 scale, most of which are behavioural and only one of which refers to mathematical skills. This is a very rigorous and potentially useful social tool but for the purposes of this research indicates very little of mathematical achievement or of mathematical progress. A copy of this Secondary Assessment Profile is included as Appendix 2.

2.4.3 A New Zealand School experience

Late in 1994 a meeting was convened by a New Zealand high school with the purpose of establishing links with its contributing schools to ensure the best possible learning

continuity is maintained for students as they move from intermediate school to high school. At that meeting there was general agreement of the inadequacy of the existing blue cards and that a portfolio of student work may be a good way of providing information for the high school relating to students achievement and progress. This portfolio would contain pieces of work selected by both the student and the teacher and it was agreed that mathematics and language would be good areas to concentrate on.

The high school agreed to provide the folders and students would be invited to select 2 pieces of writing and two pieces of mathematics work and also agreed to use the information provided in the portfolio to assist them in the class placement of the 1995 third form students.

In 1995 the high school had 120 form 3 students and folders were collected for 80 of these students. Of these 17 contained results of PAT tests, half contained some mathematics work and 18 contained the student answer sheet to part of a diagnostic test designed by the Auckland Advisory service. All of these 18 contained a basic facts speed test, a statistical display relating to a project the class had done and a number of other tasks. This would tend to suggest that for these students the selection was not by the student but rather the teacher, and that the teacher decided which items would be included irrespective of the purpose of the profile. Consequently, if a number of the students submit the same thing (the final product largely generated by computer), it is difficult for the high school to use it to distinguish the unique qualities of each student and in particular their differing mathematical skills.

In relation to the diagnostic test, if only the results are included little assistance is given to the high school without also indicating the source of the test. This particular test has been seen as not particularly useful by some high school teachers. While it does make reference to the achievement objectives of the national curriculum by level and strand, the results are not grouped by strand, as would seem logical, but by some other grouping more akin to the approach taken to teaching mathematics in the primary schools.

This then leaves approximately a quarter of the folders with a range of mathematical work - from homework exercises to quite sophisticated data analysis; from several small tasks to folders which included several complete mathematics workbooks.

It was interesting to note that of the 17 folders containing the PAT test results, 4 were at the high ability end and the remainder at the low end. This would tend to suggest that PAT tests were being used as a tool to identify these groups of students. It is also significant that for those on the lower end of the ability scale there was a substantial body of material in a range of subject areas to give a good indication both of student achievement and progress. These students came from the same school as those with the diagnostic test but there is no evidence they did this test. It is also interesting that all of these 13 students had worksheets which were designed for the Mathematics Applied course in Form 5!

Of all the 80 folders only one contained work which was clearly selected by the student. As to how much use they were to the high school, the Guidance Counsellor and Form 3 Dean placed the students into mixed ability classes predominantly using the blue cards as a guide. The reasons cited for not relying too heavily on the folders include:

1. Each student did not provide a folder
2. The material in them did not provide a particularly useful guide as to student ability
3. There was a large variation of quantity of work in the folders
4. The blue record card was the major source of data as almost all students were accompanied by one.

It is clear that the enthusiasm and commitment of the staff in the contributing school to the idea of a folder of work was the main reason for those folders which were handed on to the high school. The idea of providing a folder of work for each student did not win universal support from contributing schools. It is also evident that the purpose of the folder was not consistently clear in the minds of the contributing staff. There was a wide

variation in what was seen as important and therefore direct comparisons became difficult to make. Hindsight has indicated that many of the folders that were supplied were compiled in haste near the end of the year, prompted by the request from the high school. But the biggest concern of the staff from contributing schools was the amount of effort required on their part to collate such a folder (near the end of year) if little use was going to be made of it. This view was based on their past experiences of the communication between the high school and its contributing school, a view which sadly still prevails.

In 1995 the Deputy Principal of the high school, who initiated much of this work, was out of the school in term 1, the high school became busy with other issues and the project has not continued, although some feeder schools are still sending portfolios of work to the high school.

2.5 Transition point assessment

It is generally agreed that there should be adequate information available in written form regarding a child's achievement at the end of the Form 2 year, but what is not clear is exactly what information should be collected and how best to present it.

In order to ensure the effectiveness of the National Curriculum Framework, the Ministry of Education proposed to have a programme for national monitoring using standardised procedures at strategic points along the process. It was planned that this would be by light sampling at the end of years 4 and 8 (Ministry of Education, 1993 page 25). These have subsequently been described as transition point assessments (Ministry of Education, 1994 page 13) as they refer to the points at which students generally transfer from primary school to intermediate school and intermediate school to high school. The intention (page 27) was to develop a resource bank of activities to form the basis of assessment at these points. Croft et. al. (1996) confirm that it is government policy to have a transition point assessment at the end of Form 2.

Irwin (1994, page 59) commends the concept of transition point assessment describing similarities with English and Welsh experiences. He describes the main difference between those regimes and the New Zealand plan is that in the New Zealand regime the assessment is for the purpose of guiding programme development and teaching rather than accountability. He goes on to say that if these tests are used for more than diagnostic purposes they should be avoided. Any use for comparison of a group of students on the basis of these tests would mean that the test becomes 'high stakes' and its use would not be consistent with its purpose.

Croft et. al. were contracted to the Ministry of Education to develop an assessment resource bank which might be useful for transition point assessment. Two of their objectives were:

1. To implement on a regional basis national and school based uses of assessment resource banks in mathematics and science, for curriculum levels 3-6.
2. To evaluate and report on major outcomes of the implementation trial and suggest options for the future.

Croft et. al. , 1996 page 7

Croft et. al. (1996) were involved in the development of the Assessment Resources Banks (ARB's) trial implementation trial in 1993-1994 with subsequent additions and modifications trialed in 1995. These were set up to assist teachers with school-based assessment in mathematics (and science) and also to be used for national monitoring for the Ministry of Education as required in the form of transition point assessment. This was a sophisticated project involving the storage, retrieval and distribution of item banks of questions electronically and on paper and involving a number of schools at different levels. Each of the questions in this resource bank are referenced by strand and by curriculum level for each subject. One of the issues raised in the recommendations of this report (page 81) is that of the emphasis placed on a national test if there was to be one. In relation to the future use of ARB's they recognise the 'high stakes' nature of

such a single test if applied nationally. There is genuine concern about the distortion resulting from schools competitively publicising their results and thereby not using the test for the purposes for which it was intended. It is suggested that there is doubt that a single test could adequately assess the 5 strands of the mathematics curriculum and therefore it should be used as an adjunct to some other form of assessment.

If such an assessment did take place (page 85) it would be possible to gain a national profile of all students by level and by strand without too much difficulty but with some expense. "It would support the importance of the New Zealand Curriculum Framework, and would illustrate distribution of achievement by level, between and within selected years." The most critical issues discussed in the recommendations of this report, are that the Ministry of Education must clarify the purposes for and the nature of information to be collected nationally, how all strands are to be covered and what schools should be doing with the data gained.

2.6 The Student in transition

Cotterell (1986, page 74) describes the transition from Primary to Secondary education in Australia as "marking distinctive phases derived from separate histories, philosophies and organisational frameworks". He goes on to describe a marked decline in school achievement accompanying this transition. A similar conclusion is made by Alspaugh and Harting (1995, page 148) when they claim that where either is a change in grade level organisation in a school there is a corresponding loss of achievement the following year, which is regained by the end of that year. This has been put forward as an argument for a middle school to minimise the effects of transition combined with social and physical changes.

In New Zealand the 10 to 14 age range (emerging adolescence) is identified by Stewart and Nolan (1992) as critical and argue that because of developmental and educational needs it is vital to keep students together in this period and recommend the formation of

middle schools to facilitate this. More recently there have been a number of middle schools set up in New Zealand as a result of this and other research.

Lappan and Ferrini-Mundy (1993, page 626) describe the middle grades in the United States as a mass of contradictions. Students are experiencing emotional, physical, social and cognitive changes that all need to be considered by the classroom teachers. By comparison to the high school they describe the middle schools as preferring active learning situations where teachers have a broad agenda - not just the mathematics curriculum. Projects and a variety of other kinds of work become "part of a portfolio that gives the student a sense of their learning over time".

Clarke (1985, page 231) discusses the changes in mathematical behaviour associated with the transition to high school in Australia and comments that "It is evident that if transition creates problems in student's mathematics education it is equally true that mathematics contributes significantly to the difficulties of the student in transition". In a later report (Clarke, 1992 page 1) he claimed that "the social and academic adjustments required by the transition are inextricably linked and, in many ways, mirror each other". Fullarton (1996) in a longitudinal study investigating the motivational behaviours across the transition collected data about an entire cohort of grade 6 students in Victoria and intends to follow them through the transition. She discusses how students' belief about their own ability and perceived competence in mathematics effect individual performance and engagement.

2.7 Curriculum Matters

2.7.1 Continuity

Stillman (1986, page 164) claims "In essence if educational continuity is to be effected, good curriculum continuity will need to be reinforced by sound assessments of the individual's progress in that curriculum".

In relation to curriculum continuity the Cockroft Report claimed:

Unless the great differences which exist are recognised in the provision which is made, those whose potential is high will be denied the opportunity to make the progress of which they are capable of and those whose attainment is limited are liable to experience continuing and dispirited failure.

Cockroft, 1982 page 128

The report goes on to discuss the need for a 'differentiated curriculum' or different courses (programmes) to meet the differing needs of the students.

Those who say that the secondary school is the best place to make assessments of students' abilities (the fresh start approach) say that all students come in with a clean slate and have equal opportunity to prove their ability. Often this is used as a justification for mixed ability class groupings where each is taught fresh work. However this view does not consider the nature of individual learning and achievement, nor does it appreciate that many of these students may have already been working with 'high school' concepts.

In this regard Stillman (1986, page 165) questions whether the receiving school by its own assessment of students ability actually reaches any different conclusions about the students than what the contributing schools would have suggested. Watson (1995, page 17) describes a variety of types of evidence used by teachers to determine student ability but because of the teachers' preconceptions and expectations of students regards the information sent by the contributing primary schools as "at worst partial and at best enriching rather than hard, true and incontrovertible". Like Stillman, she comments that her own assessments involve similar kinds of judgements and therefore may not be any better. In her school it was decided to accept the records as judgements by professional colleagues but not to use them as definitive about student potential or ability.

While not agreeing with the fresh start approach, Clarke (1992, page 18) comments, that “the commencement of secondary mathematics offers some students the chance to experience success in new areas for which past inadequacies represent no disadvantage”. Cockroft (1992, page 126) does not accept that it is justifiable for high schools to ignore the information which they receive from their contributing schools. Like Clarke, the Cockroft Report recognises that students who have not made good progress in one school may make much better progress in another school in a different learning environment.

2.7.2 Levels of achievement

The introduction of the mathematics in the New Zealand curriculum (1992) meant a change in approach from the discrete curricula of the primary years, the Forms 1 to 4 and senior curricula to a single document which outlines the mathematics curricula from year 1 (junior 1) to year 13 (Form 7). This change brought with it the concept of levels (8 of which span the 13 years) to indicate student achievement in each of 6 strands. Other curriculum statements have different numbers of strands. It has been argued (Walshaw, 1994, page 34) that the levels are not sufficiently concise to accurately pinpoint a student’s achievement as the subject of mathematics is an ongoing spiralling curriculum and many teachers found the idea that a level could be gained over 2 or more years to be very frustrating.

In order to monitor progress of students through the levels transition point assessments were proposed (Assessment: Policy to practice, 1994). Irwin (1994) describes the use of these transition point assessments as providing teachers with information on the entry characteristics of the children as they come into high school.

The English curriculum has recently been changed to introduce testing at a number of points throughout the curriculum called attainment targets. Stoessiger and Ernest (1992, page 73) describe two negative outcomes of the British national curriculum as follows:

1. Because of the hierarchical nature of the curriculum model (attainment targets at 10 levels) low attaining children may be kept working at the lowest levels until they pass the assessments This could mean a further restriction of the mathematical curriculum for low attainers to a diet of basics.
2. When the testing programme is in place, there is likely to be a tendency to 'teach to the test'.

Irwin (1994, page 33) claims that 8 levels is not sufficient as passing from one level to another could be a motivation for some students. He also claims that a fault with the levels idea is that it assumes that all subjects are learnt in the same hierarchical way which is certainly not true for mathematics.

Howson (1994, page 25) describes the difficulty in tracing content entries in Mathematics. He goes on to say that "the problem with a levels approach ... is that there is still considerable doubt in the minds of educators on when it is best to introduce particular topics." It is therefore not surprising that teachers are having some difficulty in determining at which level each student is working.

2.8 Discussion

The transition from intermediate school to high school has been clearly identified as a significant part of a child's education by a number of researchers in a number of different countries. There seems to be an increasing concern to minimise the effects of the changes caused by this transition. One of the concerns from the mathematics education viewpoint is to ensure a smooth transition in terms of the mathematics programmes. In order to do that a number of countries have introduced curriculum statements which cover the whole of a child's school education. However for this to have a great impact on smoothing the transition it has been identified that there must be

positive professional discussion and communication between schools on both sides of the transition.

One of the consequences of a national curriculum which spans a number of levels of ability is that it could be possible to determine, according to their position on the curriculum, the best levels at which a child should be learning, and hence develop suitable teaching programmes to do this.. This should be possible, indeed desirable, across the transition into high school. However questions remain as to whether this should be done on a national basis and if so, how is it to be done. The question also arises from the nature of the curriculum statement of the ease of assessing against it. Is there any great importance in identifying the level at which the student is working?

There are many questions which flow from the introduction of a new curriculum which cannot be answered by research overseas, because they apply specifically to the New Zealand Curriculum. For there to be optimal implementation of the curriculum, these questions need to be addressed.

Chapter 3 - Research Methods

3.1 Introduction

The focus of this research is a group of 4 state high schools and the 3 intermediate and 3 of the full primary schools which contribute students to them. The transition links between them are to be investigated. A provincial city, the closest region to the researcher with sufficient schools in it to give some validity to the research, was identified for this to be carried out. Conflict of interest and insufficient high schools were the reasons for the research not to be carried out in the local area of the researcher.

In this provincial city all state high schools, all intermediate schools, and a selection of full primary schools (generally with the largest Form 2 cohort) were involved. Involving all state high schools and all intermediate schools in this way resulted in a self-contained demographic region. Consequently the effect of students either leaving or entering the region in the transition to high school.

The size and scope of the research has meant that not all of the schools in the region were involved, however by involving the schools selected covers at least 80% of both Form 2 and Form 3 students. There are a number of smaller schools, full primary, intermediate and secondary in the region but it was intended to focus on the links between the schools which are most frequent.

3.2 Data Collection Techniques

The data was collected through an interview based on 22 questions [appendix 3]. To enable the interviewer to concentrate on the responses, all interviews were tape recorded (with appropriate approval of the respondent) and each respondent was given a copy of the questions in advance of the interview. The questionnaire focussed on determining

how each school is meeting the requirements of the National Curriculum, how they report to the parents and what methods are used to determine the level of achievement in each strand. In relation to the achievement levels the intention was to determine if teachers are able to accurately determine these, how they do this and whether this information is being passed on to the next school.

Interviews were arranged with the Principal of each school to be involved in the research, to request their support for this research. All were very supportive and agreed that it was an area into which some research needed to be done. It was intended at this meeting to identify the teachers to be interviewed, however in each case this was decided at a subsequent meeting with the Head of Department (in the high schools) or the Deputy Principal (intermediate and primary schools). For the purposes of this research it was intended to gain two views of what happened in each school, one from the management perspective and one from the classroom teacher perspective, although the senior teacher would most likely also be a classroom teacher. The high school Principals recommended the Heads of Department and another person whom they would identify, while the primary school principals recommended the Deputy Principal and another person whom they would identify.

Further contact was made with the schools to identify all teachers to be interviewed. Once the respondents from each school had been identified, each was contacted by telephone to arrange a time for an interview, and to discuss the ethics involved in their participation. They were also asked if they would agree to the interview being recorded. Prior to each interview (at least several days) all respondents were given a copy of the questions. The interviews took place over a two month period and all but one were arranged after school, at the school of work of each respondent. All interviews were recorded and there was scope for secondary questions which arose from particular questions.

All interviews were transcribed by the interviewer and stored electronically using a word processor. The transcripts were also arranged by question to assist in the analysis

of the data. Both the audio tapes and the transcript files have been stored in a secure place and no other person has access to them.

3.3 The Sample

The high schools surveyed for this research include all the state high schools in the provincial centre. The nearest state high school to these four is approximately twenty kilometres away. While there are 5 private schools of varying roll sizes which offer high school education, only some of their intake is from the local area with a substantial proportion from outside the region being considered in this research (boarding facilities are a major factor in this).

High School	Roll	School type	Proximity to town centre	Distance to nearest Intermediate school
A	1100	Co – Ed.	7.6 km	200 m
B	660	Co – Ed.	2 km	2.4 km
C	610	Single sex	1.2 km	200 m
D	650	Single sex	2 km	1 km

Table 2 – Features of the high schools

The four high schools described in Table 2 essentially define the geographic area for this research. High school A is much bigger than the other three and is situated in a higher socio-economic community.

The recent extension of an intermediate school in a satellite suburb, to a Form 1 to 7 school has meant roll reduction for schools B, C and D, but school A was largely untouched by this. Additionally, perhaps consequentially, there has been less direct sharing between schools B, C and D because of the intense competition for students.

This recently formed Form 1 to 7 college was not included for three reasons.

1. It is still in the process of establishing itself as a college (each year another level is added and in 1997 the college enrolled Form 7 students).
2. There is no physical transition as the intermediate and high school are on the same campus.
3. This college has a clientele which is culturally, substantially different from the others and it was felt that this may have introduced additional factors which are beyond the scope of this research.

Intermediate School	Roll	Proximity to town centre	Distance to nearest High school
A	350	1 km	200 m
B	330	2.3 km	1 km
C	440	7.5 km	200 m

Table 3 – Features of the intermediate schools

The three intermediate schools in this provincial centre are described in Table 3. One school is almost centrally located and another located on the opposite side of town to the co-educational high school.

There are a number of full primary schools on or beyond the suburban edge including the satellite suburb referred to above. A number of them, have been primary schools, but for political reasons have expanded to become full primary schools. These schools tend to be smaller in roll size and therefore more numerous. The Form 2 rolls in these schools vary from year to year, but are generally quite small. As the full primary schools span 8 age groups, the focus on the Form 2 students is much less intense than the intermediate schools, where the focus is on only two age levels.

In order to ascertain if there was a difference between the pathways from full primary to high school and intermediate to high school, three full primary schools were invited to participate. For logistical purposes the three that were chosen were those with the highest Form 2 rolls. Their features are described in table 4.

Full Primary School	Roll	Proximity to town centre	Distance to nearest High school
A	480	4 km	3 km
B	430	4.4 km	3.6 km
C	370	3.8 km	3 km

Table 4 – Features of the full primary schools

It should be noted that there are no full primary schools in the centre of the provincial town. All three of the full primary schools surveyed are within a kilometre of each other and the college referred to above. However, the researcher has subsequently found that one of the remaining full primary schools has a substantially higher Form 2 roll than any of those surveyed, but this is consistent with a somewhat fluctuating roll in these schools.

3.4 The Questionnaire

The questionnaire consisted of 22 questions in 4 sections. The questions were designed to elicit extended responses and for each question there were supplementary questions that could be asked to elicit further clarification as required. There were two slightly different versions produced of this survey. The intermediate school version differed from the high school primarily in wording, but also minus the last question from the high school version.

The questions in the questionnaire were trialled on a local primary school principal, which subsequently led to minor modifications to the wording.

A copy the high school questionnaire is included as Appendix 3.

3.5 The Nature of the Interviews

All interviews were conducted in an informal manner in an environment with which the respondents were familiar and comfortable. In most cases the interviewer had spoken to the respondent on the telephone in advance as part of the preparation for the interview, resulting in a relaxed and socially comfortable introduction to the interview. There were a number of times where supplementary questions were used to explore issues which arose from specific responses. All interviews were recorded on audio tapes, with the approval of each respondent, and subsequently transcribed by the interviewer.

Chapter 4 - Results

The procedure used in this report to differentiate between the responses to given questions from different respondents is that the responses are numbered R1, R2, etc. and the questions that are asked by the interviewer are denoted by I. This does not imply that all responses labelled R1 are from the same respondent. It was felt that labelling all responses from a particular respondent in a unique way may allow respondents to be identified, therefore responses to a particular question were numbered arbitrarily.

4.1 Contact between the schools

4.1.1 The approximate size of the groups in transition

At the beginning of the interview the respondents were asked for the approximate number of Form 2 or Form 3 students in their school. The results are shown in tables 5 and 6.

Intermediate/Primary School	Form 2 Roll
Intermediate A	170
Intermediate B	160
Intermediate C	220
Primary A	20
Primary B	24
Primary C	30
Total	624

Table 5 – Approximate Form 2 rolls of primary/intermediate schools surveyed

High School	Form 3 Roll
School A	240
School B	130
School C	150
School D	120
Total	640

Table 6 – Approximate Form 3 rolls of high schools surveyed

In some cases the respondent did not know what the roll was, as this was not one of the questions on the questionnaire, but they were able to find out at the conclusion of the interview.

It is important to note that the teachers in the primary schools indicated that their rolls at the Form 2 level have fluctuated over the past few years, primarily due to the conversion of an intermediate school in the local area into a Form 1 to 7 college. It has not been easy for these schools to predict whether students will stay on with them for both Forms 1 and 2, and thereby complete all their pre-high school education in the one institution, or move over to the college for the start of their Form 1 year to enable them to be in the same school for all 'Form' years.

4.1.2 Meetings with staff in the other schools

As the emphases of the schools on either side of the transition are different, the respective views of the meetings between the schools will be discussed separately.

4.1.2 (a) The intermediate school view of the contact

None of the respondents indicated any contact with the high school Principals. The contact with the Deputy Principal depended on which high school the majority of the students were intending to go to. The most common response was that the respondent met the Deputy Principal at or near the end of the year after the students had made their choices. The most common view was that the purpose of this meeting was to collect enrolment forms and related data but also to gather verbal information from the teachers of the students they were enrolling. However the Deputy Principal was not the only person involved in this process. Often the data was collected by the form 3 deans and/or the guidance counsellor. One respondent summarised this process as follows:

After the children have made their determination of where they are going, in November a team of people from various high schools comes in on one day and by then they know the children who have opted for their school. They want to speak both to the child and to the classroom teacher of that child. (There is no physical contact with their staff and our children in terms of trying to catch students. There are prospectuses dropped off and are given out to all children. They make the decision and their parents send the enrolment form directly to the high school)

The comment in brackets was added by the respondent as an afterthought to clarify that the process was fair to all students and staff.

It would appear that the selection of which people came to the intermediate school was a function of the high school organisation and how the roles were defined there. In some cases the Deputy Principal had a direct role, assisted by deans and Guidance Counsellor, but in another situation it was predominantly the Guidance Counsellor who was collecting the information.

There was some consistency between the intermediate schools in their contact with the staff from the high schools. It was always near the end of the year for the purpose of data collection. There was no other formal contact between the schools.

The social contact warrants special mention. Several of the respondents spoke of an attempt by one of the high schools to interact socially with the staff of intermediate schools. This was an obvious attempt at publicity and subsequently a competing school has done the same thing. One respondent describes it this way:

R: *Last year we were invited to two high schools for a social get together as a thinly disguised marketing campaign and as long as we all understood where it was coming from we all went along with it.*

I: Did it have the support of the staff?

R: *No. I put it to the staff but I got cynicism, suspicion and blanket disinterest. But I appealed to our people on the basis of neighbourliness that it was rude of us not to ... and let's not prejudge the meeting.*

The same respondent reflects on the value of the two meetings:

R: *A different high school did the same thing later in the year but the reaction was different. It was run very differently and the staff felt very positive about the second visit. If what we saw was a window into their school, they did a very good job in their own interests, the way their staff spoke to our staff, the way the principal spoke was quite different to the first experience. The first school did themselves a disservice. The second school has moved the evening from August to May.*

Other than these somewhat contrived meetings there was no social contact between the staff of the intermediate and high schools.

4.1.2 (b) The primary school view of the contact

There was even less contact between primary and high schools. One respondent describes it:

The schools will come in term 4 and talk to the students and give out information about their schools. Some schools just send the forms for us to give out.

It is presumed that there must have been some contact between high schools and Form 2 students prior to this, but this contact did not involve the respondent. Another view was:

They [the high schools] have a representative that comes in to sell the school to the students, one from each school, and then they come on a follow-up visit later on. They go through the office and are more interested in talking to the students rather than me [their class teacher].

However, recognising that there are a number of full primary schools in the area and that each only has a few Form 2 students, the following view was more consistent.

I meet with the Deputy Principal in the third or fourth term. They generally come in and have a discussion with us and come in and spend time with the appropriate children, then come back with a standard form for us to fill about the children. Deans - sometimes they come too and the second visit just the Dean will come.

Sometimes after choice is made there is a discussion with the dean where we make verbal comments about the child.

No respondents indicated any contact with the Heads of Departments or the Form 3 teachers (other than the Deans), although one response was particularly interesting as it showed that the respondent was not that familiar with the process of communication between the schools.

I don't personally have a lot of contact. The other teachers will have visits, usually by the Deputy Principal from the high schools. Followed on by Heads of Departments, but usually by the Deputy Principal or sometimes deans. No the Guidance Counsellors don't usually come in.

4.1.2 (c) The high school view of the contact

The high school respondents had little personal contact with their intermediate colleagues and often were not sure of the processes for collecting the data. One respondent mentioned the involvement of current Form 3 students in primary school sports (an issue which was highlighted as a positive initiative by some primary respondents) but had no personal contact.

The Third Form Dean would go the previous year and hand out enrolment forms etc. and also third form students helping out in such things as sports days etc.

A second view stemmed from the urgency of class placement, particularly where streaming was important. This view is more typical of that of the Head of Department and is expressed by one respondent in the following way:

I meet with the Deputy Principal perhaps 3 times a year. One of the schools does not hand on much information supposedly because of the privacy act.

We tend to meet with the person that's directing the mathematics in that school more than anyone else, like involvement in accelerate type programs.

The view from another respondent was slightly different, but emphasises the priorities of that school:

I meet with the Deputy Principal (twice maybe) to find who the students are, who they rate as being quite capable and the ones who they feel are struggling.

We very rarely talk about the ones in the middle. Form 2 teachers - we have [met with them] but not in the last 3 years or so. Something we should be doing more, but we haven't found the time to do it.

A third form of involvement (but more with the students) came from a different school:

The Deputy Principal would go with the Deans and they go at least twice. They bring all the Form 2's to the school. They bring them here on one afternoon in Term 4 and they are put into groups, and they are given two lessons. So I would take two maths lessons with two different groups and they might do mathematics or art just to give them a taste of school, then they are given a bit of a talk by the Deputy Principal and the Dean, and given a bit of afternoon tea, then they go home.

The contact is mostly between the Dean, (the Third Form Dean for the next year) and the Form Two's, and that's about all. Apart from their school records coming through. No contact professionally.

4.1.3 High School visits after the transition

There was almost universal agreement that this did not happen at present but that it should happen if we are to improve the process of transition from intermediate or primary school to high school. It should be noted that a high school could have a large number of contributing schools (up to 20 in some rural New Zealand schools would not be uncommon) and visiting schools for this purpose would mean more time and commitment from high school teachers. In addition some of these schools only contribute a small number of Form 3 students and high schools would need to weigh up the viability of such visits.

This is expressed well by one respondent:

Idealistically we should, but time is a factor. It could be counterproductive because both sides are under a lot pressure and would be reluctant to attend another meeting.

Some respondents spoke of contact regarding an individual:

R1: *I've gone back to seek clarification but got no response about trying to find out what level the students were, which part of [level] 4 or 5 or whether I should be pushing students toward school certificate.*

R2: *One teacher did ring me with reference to a child I taught last year. It was more a behavioural thing wanting to find out about background. None otherwise.*

One high school respondent describes the social function mentioned in section 4.1.2 (a).

The publicity committee has decided to invite the intermediates in for afternoon tea and as part of that they thought that it would be a very good idea if they list all the students from these intermediates and [for us to] write down a positive comment about each one. It had to be positive. Any negative comments were "twinked" out or not typed in. Its hardly a reporting back to the intermediates.

However in one high school the respondents described one visit to the intermediate school.

I don't go down to the intermediate school to seek any more information about the students we have in the third form. Sometimes I go early in the year to confirm [the placements of] the most able students.

This appears to only happen in relation to mathematics as this is the only subject to stream their students.

4.1.4 The importance of a smooth transition

All respondents were asked to rate on a scale from 1 to 5 (5 being very important) of the importance to them of a smooth transition for their students from Form 2 to Form 3. The average results are shown in table 7 below.

School type	Average of responses
Primary	4.6
Intermediate	4.8
High	4.2

Table 7 – Ratings for a smooth transition

Respondents were asked to clarify their responses to this question. There was a noticeable difference between the perspectives of the high school views and the others. Perhaps this is because of the nature of the institution, where primary and intermediate schools tend to focus on the whole student whereas high schools tend to be fragmented into curriculum areas. One response captures this view:

For our school we'd like to think that they are moving smoothly into that new educational system and that they are academically capable of working in that system and have the skills ... and are mature enough to handle the peer pressure and other demands on them apart from work.

Removing the uncertainty of how the data is to be used was identified as one way of improving the transition process and helping the staff to feel more positive about it.

It would be nice to know exactly what they want, so that we can tailor some of the information we are sending up, so that it is accessible and used. I would feel more positive about doing a lot of it if I knew it was going to be of use.

None of the high school respondents mentioned the social skills referred to above, but not surprisingly, focussed more on the procedures and on mathematics.

There were a number of suggestions that respondents made to improve a smooth transition from Form 2 to Form 3. These are summarised in table 8 below.

More visits to gain familiarity with the new school
Personal contact to follow specific students through
Coordination of programmes to avoid duplication of work
Positive feed back from the high school about student progress
Positive feed back from the high school about the relevance of data
Acknowledgement of the data when it is collected
Informal meetings to discuss transition issues
Standardisation of the information to be passed between the schools

Table 8 – Suggestions to improve the transition

4.2 The written communications

As the questions in the interview were necessarily different to reflect the roles played by participants at each end of the transition, it is appropriate to discuss this section from the two different perspectives.

4.2.1 What was required of the intermediate and primary schools

There were varied responses to this question, perhaps a reflection that each high school operates slightly differently. Several documents were mentioned, the most common one being the Blue record card . A copy of this record card is included as appendix 3. Several popular test results were also referred to as being important. These included the TOSCA and PAT results. However, beyond this commonality, most pre-high schools

are generating their own documentation to, in their view, better reflect what they would like to hand on, on behalf of the student.

The perception of what was required was considerable. One response was:

Basically it has varied from year to year. Last year school C took a Tosca test at the end of the year, which isn't the right time to do that test. Other years they have asked for an overall grade for a child in each different area. Generally its just a thumbnail sketch they are after. In other years the school has come and asked "where can we stream this child? Are they high, low or average?" Generally it is limited input that they are after.

Another response reflects the apparent vagueness of the high school requests.

[They want the] PAT mark. It's not so much what they seek, its what our people tell them. They will say OK give me a pen picture of where this child is in language, maths etc. and we will say they are at level such and such strand such and such, its quite a general comment. I didn't get the impression they had specific entry points that the were wanting to put students against.

It seems disappointing to hear a senior teacher in a school not be able to clarify what is required and why it is required.

I always have the impression that they are more interested in the Tosca test and generally the PAT tests. I don't know how far up the priorities are for mathematics. It seems to be more on PAT test results in reading and language although they do take note of ability in mathematics, but I am sure they stream their classes on Tosca and PAT rather than their mathematics ability.

The views of another respondent perhaps best reflect the uncertainty of what is required.

They ask for a broad banded continuum 1 to 5. You put a mark on achievement and attitude for all the subjects, and a box for a comment. ... From what they've said over the years that helps them with their placement in classes rather than whether the students have subject knowledge. I've got quite sceptical about them [the blue record cards]. I used to invest a huge amount of energy into them and I do less now. Over the years I have felt that its not been valued so I have been a bit more casual.

However the close proximity of intermediate and high school can result in a better understanding of what is required. One such view is expressed as follows.

In October they get the blue cards. They copy the blue card, and have this in front of them in the interviews by one of the senior staff with the parents and incoming third form students. (This could be Guidance counsellor, Deputy Principal, Third Form Deans etc). Before the interviews the guidance counsellor comes down and talks with the Form 2 teachers and then they write up a profile [on each student] at the time of the interview.

So, while it is not universally clear what is required, these schools, recognising the limitations of the blue record card, are devising their own forms on which they can present information which they think that the high schools need and will use. The extent and the thoroughness of these forms is quite impressive and needless to say is much more substantial than the blue record cards. One of the respondents described what they had done.

Our school has a name for records I wrote screeds last year on individual children and their maths ability and I have a feeling that none of that would have been looked at. This was on the child's profile which is quite in depth and covers each strand and each of the topics are in a strand so there were some children last year who I taught who were on level 3 and some worked at level 4 and I had that all on my reports. So we have our records but in the end it comes

down to us transplanting our knowledge onto their forms. This was extremely frustrating. I'd spent the whole of the weekend updating the students' maths records and then to have them come in and expect a short little paragraph on their maths and I think they are not going to look at what I've spent the whole year writing.

An equally impressive, if not cumbersome system is described by another respondent.

Each school has different forms but generally ask for the same information. By the time it gets to the secondary teacher its third hand information. It comes from the maths teacher in a written or oral form to the home room teacher who then passes it on to the secondary teacher. Oral clarification is sought where the home room teacher is unsure.

The maths teacher provides information which should contain comments on each strand and the curriculum level that the student is working on. The home room teacher puts this information onto the form (provided by high school). This is a general form which has a section (quarter of a page) for each curriculum area (not in strands) . We wrote as little as possible because we had so many of them to do. The Deputy Principal asked us if we would put down the strands that we had covered and the level within those strands that each student was working at and then a comment on their attitude.

4.2.2 What the high schools required

The high school respondents are less aware of the detail of the requests made by the high schools of the intermediate and primary schools. In one respect this is not surprising as the task of collecting data from contributing schools is usually designated to a person (or small group of people), none of whom were interviewed for this research. However on the other hand as the information provided could be directly related to the

third form programme, it is surprising that many respondents did not know the detail of what was collected and how it was done. The following comments tend to reflect this.

- R1: *I don't think we do [indicate what information we seek]. The form that we send out, I've never seen before. Nothing that we as a department send out.*
- R2: *I'm not sure how much from here is actively sought from the Intermediate. They give us information on the blue cards.*
- R3: *All I have is the form that is sent out. It is very general with a grade in mathematics on whether they are excellent or satisfactory and their primary progress record. It is more social skills.*

One of the respondents went much further, providing a justification for their view.

I don't ask them for anything. Basically, I want to give the kids a fresh start. I find out for myself. I've been involved with other schools where we have asked for information and the information we have got has ranged in accuracy depending on how they interpret the curriculum and what part they might have concentrated on, and how they have assessed it and all sorts of things. So we get students for example who used to come from one school, and it was very political there, and they [the students] were told they were doing a Form 3 syllabus so these kids came and they'd say to us "we've done the Form 3 syllabus" and we'd check through and they had done some of it, but they certainly hadn't covered it in scope or perhaps in the context we thought was worthwhile. So we don't pay much credit to the information we get.

Almost all high school respondents agreed that the existing blue form gave them little information about the students mathematical ability or achievement. Some stated that comments like “works well”, “is a neat worker” and “in the top maths group” while

interesting were not particularly helpful in determining what the student had done and therefore what they should now be doing.

4.2.3 How this information is used

There is general uncertainty from the contributing schools as to how the information is used. This is largely due to the apparent lack of communication from the high schools but also because each high school operates slightly differently. One primary respondent describes their perception.

We've not been told in what way it helps the children. I'm only assuming that they look at the information and they group the children accordingly and those who are identified as "needs remedial" get put in a class who need remedial in English. It's difficult to say whether they take notice of what you are actually giving them because there is no contact with the school. One student whom I identified as needs extension was placed in an extension class, which seemed appropriate.

There is no doubt that the contributing schools generally want to provide a substantial document to summarise the ability of each student as they leave their school. This has, in most cases led to the shift to a different form of documentation, often discarding the blue record card. However the increasing quantity of evidence coming in from the contributing schools poses problems for the high school. Digesting the contents, storage and variability between schools are some of these.

However the perception that contributing schools have, of what is done with the information is uniformly vague.

R1: *I presume that it goes either to their maths teacher or their classroom teacher, but no definite idea.*

R2: *From what I understand, to stream the children, and to sort where they slot in – high, low or average. They have shown a reluctance to take on board the information we do collect. Maybe they are frightened off by the quantity. There has definitely been a reluctance to accept that information and to do anything with it.*

From the high school perspective the opinions are surprising.

R3: *I don't know if anyone reads the blue card information. Sometimes we might want to check back about a particular student when we go and look at the file. I have occasionally when I've been interested in a particular student.*

R4: *To be honest we don't do a lot because it is fragmented. It is better from one school than the rest.*

It is evident that the blue record cards and any numerical data such as PAT and Tosca are used to assist in placement of students into classes in the high schools. Each of the high schools in this survey has a different policy on how this is done. Generally this process involves a person or persons (usually the Third Form Dean and/or Guidance Counsellor) placing students into upper, lower and middle ability classes.

The Deans go through [the blue record cards]. We don't have streaming, but we have one accelerated class and all the rest are mixed ability and the Deans will look at maths, english and science. They go through their school records, particularly maths and english, their reading age and those sorts of things from their school records.

This process combines the data from contributing schools with an intuitive feeling about the student's ability. As the detail of information about the mathematical ability of the student varies, the placement is generally done on "overall ability". This may result in students being placed in high ability classes because of their ability in non-mathematical

areas and not because of their mathematical ability. The issue of streaming is an interesting one and is vigorously debated in some schools from both perspectives. Another philosophical issue was mentioned by one respondent, but by implication was common to others.

Very little [is done with the information]. The teachers of a class get a printout of the PAT results in their stanines. Some teachers would group their students according to that. It depends on your philosophical view on how accurate PAT's are as an indicator of student ability. A lot of teachers are very opposed to them. I tend to look at them and then hope that they are wrong because otherwise you teach to the expectation that that's where the students are at.

When asked why do them, the response was:

There is nothing else. It's the only thing out there at the moment that is a standardised test and it gives some sort of linkage between where they have been in intermediates and where they are going. I don't think that they are that valid, but we're stuck with them at the moment.

As far as the researcher can ascertain all the high schools keep the data collected from the contributing schools in a central storage location. This may be a legal requirement, but there is a problem with space if each student generates a wad of paper to be stored. Implied in a number of responses from respondents is the fact that only common or critical data is stored in this way and any additional information is stored in various locations for an unspecified period of time and then presumably disposed of. All teaching staff have access to these files which are most likely to be stored alphabetical by year level. However it is apparent that many third form teachers do not even sight these files.

Very little [is done with this information] as far as I know. I don't know how many maths teachers have referred to any of this information.

It is perhaps not surprising that little use is made of this information about a class if the records are not stored by class, do not contain a consistent amount of detail and what is there is not particularly detailed. However there seems to be little enthusiasm from the high school teachers (generally) to insist on the information being more detailed and thereby being more useful.

One rather interesting comment came from an intermediate respondent about the students they taught the previous year:

The students I taught are saying "we are dropping back a level" [when we get to high school]. I take the top accelerate class, ... and maths has been a strength of this school. They go to the high schools and they don't seem to group the students on maths ability so even though they may have come from a top stream class, they are with children of average maths ability. I do know a lot of the children say they don't enjoy maths especially in that first year. They get frustrated with the lack of pace and variety which is geared to the average ability of that class.

Another view of the use of the data collected is perhaps a little cynical but does reflect the potential for inflexibility of high school systems. How can they be absolutely sure that they have the class placements right on the basis of one test, and why should students not be allowed to move from one class to another if the placement is not right?

With the very best of intentions they gather this information and I am very sceptical about it going any further than the guidance people, based on informal feedback. Possibly they mean to and in some subjects they do look at it. However parents of students I've taught have said the high school teachers have said that its too late to do anything about class placement. This was done on the basis of a test that was run.

4.3 Assessment and reporting

4.3.1 The school report and mathematics

There are big differences between the schools in the way they report the progress and attainment of the students at their schools. The primary schools have been very innovative in the way they are approaching the reporting of student progress to parents. The nature of primary education is such that critical information on student development needs to be recorded and updated on a regular basis. This can then be handed on to the next teacher at the end of the year. In this way a running profile of the student's achievements and milestones can be developed. The introduction of the National Curriculum statements in the eight essential learning areas has meant that the primary schools now have a common approach to all areas of the curriculum. This has given the impetus for developing strand based profile writing in all learning areas and culminating at Form 2 where the teacher has a quite accurate picture of the student's ability as they leave the school. The report to the parents is not yet strand based, but the intentions are there.

We [currently] show maths achievement on the report - there is a comment. We haven't moved into comments on the strands. ... Yes, we should be, because for some students - if you are judging a student overall on maths you have to make one decision, but if you are working in the strands and some students are not bad at geometry, or they might find statistics pretty hard or algebra, so they achieve in some. We are going to do it in our interviews with parents which come up in June. I've suggested to staff, particularly more so the senior area, that that's how they report, everything in strands.

Another respondent described their procedures.

The parents want something quite simple. Maybe a comment about where the strength or weakness lies. The oral report it is a bit more specific. The teachers

do explain the levels system, and the child is working at this level but generally at a level above it. Overall the parents do find the levels system difficult to understand. The difficulty for many is that the child has been at school for 7 or 8 years why are they only working at level 2 or 3?

The intermediate schools have been very traditional in their reporting. The reports allow only a comment on mathematics achievement. While some give an indicator of strength, weakness or having difficulty in each strand, others are a general comment on mathematics ability. All intermediate schools are looking in the future to report the level at which the student is working. Like the primary schools they are not sure whether an indicator of level will be well understood by the parents.

One of the intermediate schools is planning to develop a profile of the student in each learning area which is updated at the end of each section of work. This profile will contain a running indicator of the levels of achievement in each strand of each of the learning areas and which will be updated on a regular basis.

The personal profile will replace the blue card. We are not going to show what level that the students are working at on the report because I don't think that the parents would understand.

In the high schools there is less enthusiasm to move from the traditional comments on attitude, conduct and effort (with some numbers and/or grades to support the comments) and to embrace the concept of reporting against the national curriculum.

R1: *It tends to be very general at the moment. We've found that parents want a general written comment. We also have two criteria which we give a grading from excellent to poor: Basic numerical skills, application skills.*

R2: *On an A to E grade on achievement and an A - E grade for effort and general comments... [To grade achievement] all students do a common test and all*

results are put on a grid and the top students get the A's etc, by ruling lines across.

But there are some high school teachers that would not be unhappy to move to something better.

R3: *We report on behavioural aspects: effort, mathematical language (although how that's assessed I don't know - it seems to be purely arbitrary) completion of work and then a space for a comment and when writing reports I always try to comment on the strand which we've studied but I haven't been putting the level in the strand.*

Another school reports using computer generated reports.

R4: *There are about 200 [statements] for maths and we try and string them together in sentences on the computer. Its about an eight line paragraph. They are under specific headings about certain things that we consider important at the time we set it up [about 4 years ago].*

I: Are you considering reporting in the strands?

R4: *I don't want to report in terms of strand objectives because I don't like the artificial nature of it. The strands are very skills based and skills are only a part of the involvement. I like to report on students making progress in terms of their confidence, to use mathematical things, and part of it is skills, they do have to learn some skills, but I am more concerned with their improvement in a general sense.*

I would assess against the National Curriculum but only because I'm required to. I'm not a great fan of the National Curriculum

And another comment:

No. Should we be looking at reporting in the strands? We do assess in the strands. But reporting? I really don't know how relevant that is to the parents.

So, currently both the primary and intermediate schools are either reporting to reflect the national curriculum or are moving toward doing so in the near future. The high schools seem much more reluctant to do this.

As to whether the report reflects the National Curriculum one respondent replies:

It doesn't at the present, but it may do in future. We are looking at a the problems and logistics of a single page or a stapled together type document. We have to balance that up with the parents understanding of the curriculum. A lot of teachers are struggling to keep up with the pace of change in curriculum development.

What is interesting is that there is a substantial body of data being gathered about the ability of each student as measured against the learning objectives of the national curriculum. This information contained in what is loosely described as a “profile” is portable and is being handed on with the student. However when it comes to the transition into high school the high schools are much less enthusiastic to accept it and do not seem keen to build their programmes around it.

4.3.2 Determining the levels in each strand

This is one of the issues on which there is the most difference between the high schools and their contributing schools. The approaches to this issue reflect the differing philosophies, focii, time commitments and curriculum emphases of the different institutions.

The primary school teachers say they know where on the curriculum each student is and also are able to indicate how they can determine this.

R1: Firstly you've got the profile, that gives you a starting point, and you know when you've covered that information and they need to move on, then there's a pre test when available, thirdly you generally know your students and what they are going to cope with, fourthly there is maintenance work - going over background information and sometimes that is a guide to me... But it is a tricky one to say whether they should be definitely on level 3 or level 4. It is in a sense intuitive. It comes down to knowing the children which in this situation, seeing them everyday in the classroom, you know what their ability is.

I can imagine it is more difficult for high school teachers who only see the students 3 or 4 hours a week because one aspect would be their reading skills. I have a lot of children who can actually do the maths but when it comes to giving them some written information and reading what they have to do, they will back off and think they can't do it but if I help them through that then they find they can do that activity.... We do not do a lot of written assessment mainly group work. We do not use a lot of written tests to help us determine the level.

However some of the methodology is difficult to follow. One respondent entered into this dialogue:

R2: Using the diagnostic book [Auckland Advisory Service, 1994] with a test for each strand area and if I put all my numbers in the right places it tells me the level of the children and if that's too confusing or I don't have enough time to do it I refer to the objectives and I design my own test which I actually find easier.

I: Do you have an analysis for every student?

R2: No, I do it for the majority of my class. For the students that I have at either end, If I don't think they will cope with the [diagnostic] test at all or if I think it's too

easy and I can't get them into another maths class then I'll set them something of my own to evaluate how they are doing.

I: What do you mean when you say you write your own test to determine which levels they are at?

R2: *I write problems and small exercises that I base on the achievement objectives for the levels.*

I: So one question for each objective?

R2: *No, two or three.*

I: How many of the level 3 geometry objectives do you have to have right before you consider the student to be a level 4 student, or does it not work that way?

R2: *If I choose in my unit to look at three or four of the objectives then those are the ones I focus on, and hopefully if my evaluation is any good then I'll be stating which ones I looked at basing my evaluation of their progress, whether they should be moved onto another level will be on those objectives and not on the others. So I guess there is a gap there.*

Covering all the objectives takes up a lot of time and we don't actually have that much time.

I: So are you saying that you might be making a judgement about the level of a student in Geometry level 3, say, that they may be competent in 4 of the 8 objectives but not necessarily the others?

R2: *Yes.*

I: So of the 30 objectives for level 3, how many could a student be competent in to be moved onto level 4? [pause] Is it just a matter of ticking the boxes to determine whether they should be moved on?

R2: *Most of my class is at level 2 and they have 3 or 4 objectives [at level 2] and I can test or look at in class situations those 4 because I very seldom say that a student can go onto the next level, because their retention is very low. So I'd hopefully be able to look at them all even if they weren't involved in the unit. So if I moved them up a level then hopefully I'd look at them all, I'm not saying that that would necessarily happen.*

I: If we look at level 2 geometry say, do you have to get them all? If you miss one, do you still hold them at level 2?

R2: *No, If they are achieving above 75% then I'll move them to a different work group within the class.*

I: At the end of each unit do you do post test?

R2: *I prefer to do it through observation and looking at their workbooks. My students get freaked out in test situations, and those tests don't get completed in one lesson. The middle groups [levels 3 and 4] do post tests most of the time.*

So how does this respondent determine at what level the student is? Presumably by measuring against the objectives identified in the problems and small exercises used. For the group of students being discussed here this would invariably be by observation and not test.

Another dialogue with an intermediate school respondent took a similar line.

R3: *Within each unit there might be 7 content objectives. There is no requirement to cover all of those. You may pick out 3 content objectives and they are your focus for that unit for this year. At the end of that, regardless of how many objectives you've taught you assess the performance of that child against those objectives only and you strike a level for that. This is saying that for the content that he has covered within our school this year his performance is at level 3.*

I: The student may not have covered some of the objectives in algebra at level 3 in their Form 2 year?

R3: *Correct.*

I: Although you've identified that they are competent in level 3 (in the work that they have done)?

R3: *Correct. It would be almost impossible to cover all of the objectives in a year and do it in a manner that the new curriculum wants us to do it. The assessment is not based on one exercise at the end of a two week block of teaching. There is a lot of classroom based assessments that have taken place. By the time we get to the end of that unit teachers will have made judgements about the students as they are working through activities. ... If a child was at level 3 and was scoring consistently well at level 3, you would need to take them through to find where they start to fall off. You can't assume that because they can handle level 3 that's where they are at. They may well have handled level 4 the same. You need to keep on taking them through until you see them tail off and then you go back a chunk from there and say the best fit for them, they can do some level 4 stuff quite well but generally they are performing solidly at level 3. Consistently, comfortable, showing success, shows understanding.*

Another respondent describes it slightly differently.

R4: *I think this is a professional judgement and by comparison with students in other classes at a similar standard.*

I: On what basis do you make that professional judgement?

R4: *The information in the curriculum, experience, pre and post testing.*

I: Is it important [to know the level]?

R4: *For the child No. For us? What it's used for? If I was teaching a group of children at the higher end of level 3 and they did the work with full understanding then you would automatically move them on. You wouldn't think 'no they've got to stay here'*

I: Do you cover all level 3 objectives in a Form 2 year?

R4: *Not all. I guess some you would cover in more depth than others.*

I: There could be gaps then?

R4: *No, we wouldn't write them down as level 4 if they hadn't mastered them.*

I: So they have to master all of them?

R4: *No, we would write that some learning objectives are not covered in their assessment.*

When asked explicitly to describe how they determine the levels in each strand the respondents were not able to give a definitive answer. Instead it seemed to be a “gut feeling” as one respondent put it. Others describe the process as based largely on observation.

While teachers on pre-high schools were very keen to adopt the national curriculum (in all learning areas) and were also keen to base their programmes and assessment around it, they were not able to give a sound universal method of determining the levels of the students in their classes. However, in their view, the intuitive knowledge they had gained about the student based on extensive observation gives them good grounds to make a sound professional judgement about the student's performance.

The high school view is encapsulated by one respondent:

R5: *I haven't tried that hard to do it [determine the levels]. There are a whole lot of factors that influence what level they are at. You have got to have a pretty good diagnostic test to decide which level they are at. I've never seen one written yet. I think it could be done.*

I: Is it worth doing?

R5: *It's not a high priority. If you keep all these records and check exactly what level they are at do they learn any better? Sometimes we are spending so much time assessing them we are not spending enough time teaching them. The PAT is done at the third and fourth form on a historical basis. We've just always done them. We've seen them [recently updated tests] as slightly better than the old ones. We needed something where we could see some improvement.*

If we knew that students were at different levels within a class, high school teachers would need to use different strategies in their programme. This was not a feature of the primary and intermediate responses because in these environments mixed ability classes are the norm. However high school teachers, particularly mathematics teachers, tend to have a difficulty in this area.

R6: *This also implies that we are physically capable of catering for every individual's individual needs. If you are going to do the job properly it's quite mind boggling.*

I: Those that didn't master level 4 in the third form, do they still go on and do the fourth form program?

R6: *Yes, they do. There is potential for big gaps.*

I: Does this imply students enter a form level which they are not going to succeed at?

R6: *It is a difficulty. The whole method of record keeping and being able to keep up with, reviewing it and doing something about it, and adjusting it as someone meets a level and reviewing it again [is very time consuming].*

And the view of another respondent:

R7: *Last year ... we had time to go through and religiously say which particular level they [the third form] were at (in this number test anyway [the first topic]) which didn't seem to work very well. There were some level 3, some level 4 and some level 5. and then we had them all in the same class anyway and so where do you go from there?*

I: Does that imply that there are some students in a particular class whose needs are not going to meet?

R7: *I think so.*

Traditionally high school mathematics teachers have been reluctant to accept change in curriculum matters. The national curriculum is not as precise in its definition as previous schemes and consequently some high school teachers have had some difficulty implementing it and then assessing against it.

R8: *The idea of it is okay, but the concept of it is a bit loosely defined. It's a nice idea to talk about, but I don't know in actual real practical terms what it actually means and how it can be worked out. I can talk about it in general terms, but in practicalities I can see it as very difficult.*

I: Is it possible that a student could be working at levels above and below the age level?

R8: *I would be happy for that, and I would hope that it would happen in all their classes. What it is saying is that children work at the level they are achieving at and I think that is important. By putting things into levels you are making it more difficult.*

It would be fair to say that determining the curriculum levels of incoming third form students is not a high priority for most high schools. If an indicator of ability is required, a general skills test is often used and then the classroom teacher takes the class from there.

4.3.3 The seamless curriculum

This is a term which was embraced by a previous Minister of Education to describe the implementation of a national curriculum from year 1 through to year 13 and then on to the tertiary level. It is a concept in which some respondents saw the original vision and had seen the real possibilities that could develop.

R1: *Academically you might have someone working on level 2 in English, and level 3 in maths and level 5 in technology.*

R2: *That vertically children will work at a level that is appropriate to them regardless of the year level that they happen to fall into. That they can be in the third form and be sitting a fifth form subject if they are able to academically handle that subject.*

If you are in a Form 2 class and ... a child that is way above the level of that class our job would be to provide work that extended them. Theoretically a child that is a real standout should be going over to the high school and doing maths with their third formers. In reality it is harder to do that between institutions but within one institution where you have multi levels it is easier to facilitate because they are all on site.

I: Could you meet the needs of a Form 2 student at level 5 or 6?

R2: *The limitations are placed on you by the expertise of your staff. We're not specialist trained teachers whereas secondary schools are subject specialised.*

But there are those who struggle with the concept and how it can be implemented.

R3: *[We cope with the concept] Not very well. We teach third level 4 and we teach fourth form level 5. and we have remedial classes which teach lower than level 4. I don't think we cope at all well with the seamless curriculum. We don't do a lot of group work in our classes. Where we do group work its not really groups working at different levels and I think that to be successful either we've got to work in modules and perhaps be able to juggle which level of module we're working at which in terms of the timetable and teachers time is practically impossible.*

R4: *In terms of the maths curriculum, students should be able to work at any level. They're not specifically third form, and you are not working at level 4. Students should be able to work at level 3 and 5. The implementation of this is a nightmare!*

If we knew what level the students were at and we knew they were accurate, it would probably cause us a whole lot of headaches because we would have to do something about making sure that we are teaching the students at the correct level. I'm not convinced that we are teaching the students in the wrong level. The way we run our mixed ability program, although they are doing some extension work, there are still times the students are covering work that they have already seen before.

One response marks the difference between how well student needs are met in primary and intermediate schools and how well they are met in high school.

R5: *I don't know that it [the seamless curriculum] is any real different from the spiral curriculum or any other term that they have used. The students should be progressing at their own rate through the various levels and each topic is taught at different levels and builds on the skills of the levels before.*

I: Supposed that a student is only just working at level 3 what do you then do?

R5: *We still take them through the level 4 program. Individual teachers will set individual work for students.*

I: If they have only achieved level 2 then it seems pointless to start them at level 4 doesn't it?

R5: *It does. In actual practise you will pick up the extremes and the rest are expected to muddle along or you might sit them with someone else that can coach them along as they go. This is definitely potential for negative attitudes toward the*

subject. .. We tend to take a class, we don't group them as much as we should nor cater for the levels as much as we should.

This respondent has clearly understood the concept in the initial response. Although it appears that she has given the wrong level in the second response, this is in fact what happens in a number of high school classrooms. There are many students who were 'good at maths' in intermediate school but because they don't get the individual attention they need and are often put in a class whose programme is much more difficult than they can handle at the time. The consequences are well described.

4.4 The levels at the point of transition

When asked to identify the level which the students had achieved by the end of Form 2 and the beginning of Form 3 there was a significant difference between the respondents on either side of the transition. The comments are best illustrated in tables 9 and 10 below.

Expect to be finishing level 4
Confident at level 4, 70% completed level 3
60% working at level 4 when the leave
Level 4 going into level 5
About 40% completed level 3 and above
Comfortable at level 3 and above
85% complete level 3
Working at level 3 or level 4
75% mastered level 3
90% completed level 3 or above

Table 9 – Primary/Intermediate school perceptions of levels at the transition point

The first 4 responses in table 9 were from the primary schools and are noticeably different from both the intermediate responses and the high school responses in table 10.

Beginning level 4
70% working at level 4
60% working at level 3 or above
Ready to start level 4
Supposedly level 4
80% mastered level 4 or above
20% mastered level 3, 50% mastered level 2
60% working at level 3 and above

Table 10 - High school perceptions of the level at the transition point

There is therefore some confusion about where the majority of the students should have progressed to at the end of Form 2. Two conflicting intermediate responses are significant:

R1: *Generally I understand that level 4 is an acceptable level for most Form 2 children to be working at. Our accelerate are already working on level 5 our remedial [classes] will still be at level 3.*

R2: *The general perception is that level 4 is Form 3.*

Alongside this are two comments from the high school respondents.

R3: *When they arrive most of them would be Level 3. There would still be some that would be Level 2. We would have some who would cope comfortably at Level 4. I'd say about 20%.*

R4: *A Full range of level 3. The average student would be at the top end of level 2. The third form program is based around level 4 and we do reach back and pick up some level 3 ideas.*

This last comment came from the respondent who made comment 7 in table 10 above. This may not have been a general statement about Form 3 students, but rather a reflection of the students in their class at the time (which was a low ability class in a streamed environment).

4.5 Levels spanning more than one year group

This question arose from the fact that 8 curriculum levels are used to describe the progress of students through 13 years of education. In the draft national curriculum document the progression was stated:

Level 4 will be reached by the majority of learners during F1 or F2 [Form 1 or Form 2], with some achieving it considerably earlier and some later.

Level 5 will be achieved some time in F3 to F5. A large proportion of students will have achieved at this level by the end of F3. Most of the students will have reached it before the end of F4.

Ministry of Education, 1992, page 14.

However the final curriculum document does not contain these statements. Instead there are grayscale overlapping regions with faded edges to aid the perception that there would be no definite cut-off boundaries between the levels.

Generally respondents were comfortable about the fact that each level covered several chronological year levels. There were some interesting responses to the question though.

- R1: *It would be lovely to have a structured system where you say this year they have got to do this, this and this. That would make my job easier. This makes my job harder, but it does give me that time to try and try again to get them through that over two years.*
- R2: *Spending two years in a level is not a problem if they are not going to be repeating the same activities. If they get the same skills and concepts presented to them in a new way then that will improve their retention.*
- R3: *I would like it to be more defined as in this is a third form course etc. I know there would be variations and some would take two years in order to achieve it but I would like it to be more specific.*
- R4: *It allows you to hedge your bets a bit. The more precise it is, the more you can be held accountable to where children are at. Its understandable that children within an age range are going to spread and always have. The time span is not all that relevant. Its only a way of trying to pitch it to people to understand that a level is not a point. it is a span of time. I don't see the time span as being all that important. They come to you at where they are, you take them from there as far as you can and what anyone else calls it is doesn't change where they are or speed up how fast you can move them. Its almost irrelevant. That's the danger of trying to profile things too much.*
- R5: *The concept is hard because the child looks as though they are never moving. I don't like that and the parents like to see improvement. If you say they are in level 3 in Form 1 and at the end you say your child is working really well at level 3, how ridiculous. It's difficult to explain to others who are not in the scheme of it.*
- R6: *It was clearer in the draft then it became fuzzy. So where do you come out of 3 and into 4. I can see the that fuzzy bit, but there is no clear-cut place you can*

say a kid should be out of 3 and into 4. I think that is what they are trying to say. I suppose that is right in a way.

R7: *I think it's a nice concept ideally, but I think practically it makes things very difficult.*

If you are going to have levels in a National Curriculum then to me that [having levels matching age level] seems a logical way to do it.

R8: *We don't operate that way, so it's not a relevant to us.*

R9: *Its the truth but we don't have enough detailed information to operate that system effectively. Even now with the burgundy book [Mathematics in the National Curriculum] we're still not sure where and when the levels end and where they should begin.*

4.6 The ideal mathematics learning environment

There were a variety of responses to this question and as the responses from the high school respondents were sufficiently different from the others, these have been listed in tables 11 and 12.

Smaller classes to allow for multi-level teaching
Lots of practical equipment
Teachers have time and money to develop resources
More practical resources
Time to reflect on the changes in teaching methodology required
Lots of professional development
Good teachers
Reduced teacher workload
Better systems for recording student achievement
Instant access to computers and graphic calculators
Classes not structured to an examination system
No discipline or behaviour problems

Table 11 - Features of an ideal environment identified by high school respondents

The children are comfortable and confident in their room
There are more resources – kits with pre and post tests
Teachers have plenty of time to develop resources
The learning is not restricted to the classroom and is based on realistic opportunities for students to use their skills
Lots of calculators
There are community based activities
There needs to be a lot of cross-curricular work
Small class sizes
Groupings to provide more homogeneous groups
Much group teaching
Activity based investigations with lots of discussion
Where students are prepared to take risks
There is enjoyment of success and students are gaining confidence in their work
Having good teachers and lots of inservice time

Table 12 - Features of an ideal environment identified by primary/intermediate respondents

There is no doubt that these are not an exhaustive lists and as all respondents would agree there are substantial external factors influencing whether some of these can be implemented. The comment from one respondent warrants attention as it reflects the general high level of commitment of teachers and their desire to do the job for which they are paid.

I could do a really good job with 10 or 15 students. Provided a student is not mentally retarded, I can teach them anything in the right time and conditions and environment.

Chapter 5 - Discussion

5.1 Contact between schools

The contact between the schools involved in this survey seems to be very minimal and appears to only happen when one side of the transition process wants something of the other. Almost all the respondents agreed that more contact between the schools ought to take place but some teachers, particularly in the intermediate schools, felt that it should be the high schools that initiate this. Many of the teachers also spoke of experiences or contacts in the past, most of which were counter-productive.

None of the intermediate school teachers interviewed are involved in the local mathematics association, although one is heavily involved in the organisation of an inter-school Mathletics programme. The reasons stated for this were the lack of time, a view that these were primarily for high school teachers, and being unaware of existence of an association. The latter view is a concern that indicates that useful information going into schools is often not directed to the people who could best use it.

It was certainly noticeable in the intermediate schools that there was general support for contact between them and the high schools and that there was lots of material which could be handed on, on such occasions. A view shared by many was that “we have the information here, if they want it they can come and get it, and that they haven’t, indicates that they don’t seem interested”. However it must be recognised that there are those who will say of any high school initiative that it is blatant advertising particularly in this time of competitiveness, and become somewhat cynical about it. This was quite noticeable with the competition between two of the high schools to organise information evenings for the intermediate schools, each trying to out do the other in trying to impress teachers of prospective clients.

The only organised contacts which seem to be made between the schools are for the purpose of enrolling students for the following year. This is usually the responsibility of the guidance counsellor or third form deans and takes place in the second half of the year. When this happens, it is often the high school staff coming in to talk to the students and their Form 2 teachers are not involved. On other occasions the Form 2 teachers are “grilled” for up to an hour going over each of their students. It is disappointing that no followup visits are made to the schools the following year about the effectiveness of the transition for the students involved. This should be an essential part of the link between the two schools according to Cally & Seyfarth (1995) and allows for the building of a link providing useful material in an agreeable form. In addition there seems to be no planned contact between the teachers of Form 3 students and the teachers who taught these students in Form 2. A few isolated cases were identified where the high school had made contact with the intermediate school about a particular student but this was generally behaviour related rather than subject specific.

It is perhaps not surprising that there is little follow up feedback in the year after the transition. Teachers are very busy people, particularly in the first month of the school year, as they all want to establish routines for the year. This is true for teachers on both sides of the transition. The primary and intermediate teachers are engrossed in preparing their Form 2 charges for what lies beyond their last year in their charge. The high school teachers have another new cohort which need to be “broken in” and steered toward academic success (or otherwise). In both cases the thought of additional meetings in this period of time brings a less than enthusiastic response.

Another reason that could be suggested for the apparent lack of consultation is that the subject teachers themselves did not have the initial contact and therefore have no obligation to followup with any visits. This would tend to suggest that ownership of the responsibility may be one way of making meaningful on going two way contact between the school.

There is anecdotal evidence of some tension between the teachers covered by awards negotiated by the New Zealand Educational Institute (primary and intermediate) and Post Primary Teachers Association (high school). This relates to the issue of equal pay for people in both awards with the same experience, qualification and job type. As a consequence the teachers covered by the NZEI award have felt put down and undervalued by high school teachers generally and some even speak of personal derision. Against this background, attempts to make contact with primary and intermediate school teachers by high school teachers it is not surprising that there is some cynicism and suspicion.

It was identified that a number of Form 2 teachers knew very little about the structure of the high schools into which their students would be going. Again this reflects a direct lack of information from the high schools to inform not only students but also teachers of the ways in which they work, particularly in relation to progression along a national curricula. This makes the process of the teacher giving advice to the Form 2 students about the issues to be faced in the future much harder. Many of the respondents agreed that this transition was quite stressful for the students, particularly those in the full primary schools, and therefore it would be an advantage for their classroom teachers to know more about how the high schools operate.

It was an over-riding observation from the pre high school teachers that any contact initiated by the high schools was done for a specific purpose and that social niceties were generally not part of that. Once the information had been obtained, the contact ceased for that year. It could reasonably be assumed that the high school view is that we have our charges now and they are now our responsibility. It may also be that if high schools change the deans of each year level, there may not be the consistency from year to year to develop the ongoing contact with their contributing schools.

5.2 Passing information

The intermediate respondents generally did not know what was required by the high school in terms of mathematical ability. A typical comment is

They do take note of maths ability, but I'm sure they stream their classes on TOSCA and PAT rather than on maths ability.

The forms that are sent out by the high schools, unsighted by a number of high school teachers, ask very general questions about behaviour, sport and cultural activities and if the student needs extension or remedial assistance. Most focus on PAT results, TOSCA results and the general comments written by the guidance staff or Third Form Dean on their visit to the intermediate school.

There are two sources of information for the high schools. The first is the blue record card, which is an ongoing record of student achievement. The other source is a form generally completed by the Form 2 teachers once the student has made a decision regarding which school they are going to attend. The Form 2 teachers have generally not been at all impressed with the forms sent to them, particularly after many of them have spent some time completing an extensive profile on each student which details where each student is on national curricula. Further, some of the intermediate schools are, in the next year or so, not planning to forward blue record cards, and are only planning to submit profiles on each student.

There seems therefore to be an increasing diversity of documentation relating to student achievement coming from the intermediate schools reflecting their view of what they see to be important to hand on to the high school. It is clear that the high schools are not yet equipped to handle this variety and those schools with a more traditional background have adapted very little to this change. There is some doubt as to the validity of the PAT test and the TOSCA test, particularly in relation to the recent changes in national curricula, however the high schools are persisting with it as a major identifier of student

ability. Perhaps this is because a school may have been using the PAT for years and think that they can get a ‘gut feeling’ about the student from it. However this denies the fact that at this stage the PAT does not reflect the national curriculum (which is the basis for the intermediate program) and that it relies on good comprehension skills. In addition there seems some reluctance to change from “something we know” to something that does not yet have national credibility. It was argued by some that although the PAT has flaws, it is still a nationally standardised test and at this point there is no valid and reliable alternative.

A number of respondents were keen on the “fresh start approach”. They suggested that the transition to high school was an ideal opportunity for students to move into a new environment and with a new teacher, a new school it is possible that a student who was under achieving or a low achiever may accept the challenge of their new situation. It was stated that no matter how good the intent is, the teachers perception of a child is often influenced by what others have written about that child. If the child has been labelled in some way, this was often the way that high school teachers perceived that child and the child had to prove otherwise, rather than the reverse which is more desirable where the child is assumed at an acceptable level until the show otherwise. One teacher’s comment about the blue record cards and the PAT results of her class:

R1: *I tend to look at them and hope they are wrong, because otherwise you teach to the expectation that that’s where the students are at!*

There is concern in the intermediate schools about the value of the work they do for the high schools in relation to identifying student achievements.

R2: *I’ve got quite sceptical about them. I used to invest a huge amount of energy into them [the high school forms] and I do less now. Over the years I have felt that it is not valued so I have been a bit more casual.*

This is not surprising if the high schools are not using the information on a curriculum basis and are only using the information for class placements at the beginning of the year. In order to get the most useful material from the intermediate schools the high schools must clearly inform their feeder schools what information they require and what is done with this information or they risk not getting any useful information at all.

Although not stated, it was clear there was some level of professional distrust of the information that some intermediate schools were compiling on each student. There were two issues at stake here. The first, is that of jealousy, whereby the high school teachers were observing that the intermediate schools were claiming that they had done what high schools have said was very difficult if not impossible, that is, assess against the strands of national curriculum in each of the levels. This implies a good working knowledge of the detail of the national curriculum, something which I suspect that some high school teachers may not have. The second issue is that of context. High school teachers would assert that just because a student has mastered a particular skill on one day does not indicate that the student has general competency at that level. Indeed this is a complex issue, for which there are no simple solutions, and one which is at the basis of the national curriculum and even carries through to the implementation of the National Qualifications Framework in the senior high school.

With regard to the detail of what high schools require, it is apparent that the force behind the collection of this data is the enrolment process. In some cases teachers were not aware of the information collected and in most cases the high school teachers thought that the information provided was of little use in its current form because it was so general. However, even if more information was collected they would be less than enthusiastic to use it for reasons mentioned earlier. It does seem then there is a problem of communication and/or expediency between the high school teachers who could use detailed information, if it were accurate, the intermediate school teachers who provide it and the high school administration who only want “thumbnail sketches” of the incoming students.

This conflict of purpose is best expressed first by an intermediate school teacher:

R3: *I wrote screeds last year on individual children and their maths ability and I have a feeling that none of that would have been looked at.*

It is then expressed by a high school teacher:

R4: *I went through all the blue cards of my class and most of it had things like 'works well' or 'is a neat worker' It actually told me nothing at all about their mathematical ability. Some had "were in the top maths group' but didn't tell me what they were doing.*

Now although these are speaking of two different documents, it reflects the need for a unified approach to identify the information which would be useful and how it is to be presented. The consistent view of high school teachers was that the mathematical information on the enrolment form was of little value in its current form for third form classroom teachers.

A more compelling argument for a unified documentation is the fact that in any one high school in New Zealand there would be students coming from up to twenty different contributing schools. If each has their own form which may provide a range of detail from little to a lot, the high schools are not going jump for joy at the thought of comparing their students. It is also important to note that a significant proportion of students move into high schools and have no accompanying documentation.

Another aspect is the use to which the documentation is put. In most high schools the documentation is used to get a general impression of student ability and character in order to do two things. Firstly the student is placed in a class of similar ability students, if streaming is used, and secondly attempts are made to group students who will support and work well with each other but also to break undesirable combinations of students. In most cases the bare essential documents are stored in some central filing system which

is accessible to all teaching staff. It is unclear what is done with any books, folios of work and other additional documents that may be accumulated. It is evident that these files are rarely looked at again by anyone in the high school after the transition has been made. As the subject information is very general, there is little to be gained by the subject teachers viewing them. When they do they see reference to BSM topics (Beginning School Mathematics) with which most high school teachers are unfamiliar.

It seems therefore to be a major misunderstanding of the purpose of the transition documentation which will not be resolved without communication of what is required and the purpose for its use. It may well be that there should be two documents. The first could deal with general ability and the second is subject specific and is handed on to the respective subject teachers. But the real question of what to do with this information would still remain.

5.3 Student Placement

There is no doubt that the information collected from intermediate schools was used predominantly to determine class placement. However, the people doing the placements were the guidance staff, third form deans and senior staff, none of whom were interviewed for this research, so it is difficult to ascertain the exact nature of the process.

It is surprising that in three of the four high schools, student placement is done on the basis of the results of PAT tests in other subjects. In the fourth high school the placement was done on achievement testing in a number of subjects. For this year, all Heads of Department had no say at all in this process. One expressed a desire to band the classes next year in mathematics and wanted to be involved in the process of class allocation to ensure that it would happen.

There does appear to be a significant difference in philosophy between the high schools and the intermediate schools, not including the full primary schools, as the largest

supplier of students to the high schools, on the issue of streaming. In all of the intermediate schools, mathematics is treated differently from the other subjects and groups are streamed off into the more able, usually 2 classes and often called accelerate, the less able, usually 2 classes, and a middle group, of about 3 or 4 classes. Students are placed in these classes on the basis of a skills test early in each year and there can be movement between the groups.

In three of the four high schools only one class of more able students, accelerate, are separated from the rest and all other classes are of a mixed ability of students.

It is not surprising, then, that some intermediate students encounter some difficulty adjusting to the mixed ability setting of the high school. Although this is in most high schools a politically sensitive issue, it must be seen as a natural consequence of the progress of the students from intermediate to high school. If, as was the intention of The Curriculum Framework (Ministry of Education, 1992), the students will need to be working at their own levels. To best facilitate this the intermediate schools have identified students of similar ability to work together, however what happens in high school mathematics classes may well be determined by a school wide policy which may not necessarily take into view the special nature of the learning of mathematics. There are those that would argue that a mixed ability class in the third form is the best way to teach mathematics as all share in the learning in a cooperative way. There is no certainty, however, of the more able students in this situation being extended to reach their full potential. Indeed one of the participants, a very capable teacher, agrees that the group that she feels is most often not challenged is the more able group in her class.

One of the high schools has a programme in which, for one lesson a week, both the more and the less able students are withdrawn from all classes and given an extension programme, for the more able and remedial assistance, for the less able. This, when initially introduced, drew unfavourable parent reaction but after several years of operation has now gained the acceptance from the community. In this school the students do the work in their normal class and when finished they switch over to their

extra work. The teachers in the school are very positive about meeting the needs of all the students but there is the potential for big gaps in student learning to occur. In this school all Form 3 students work on a program based on level 4 and in the fourth form they work on a program based on level 5, so there are going to be problems for those who do not cope well with level 4 in Form 3. This school has a special relationship with their main intermediate school because they are on adjacent properties.

For the other high schools the majority of the classes are mixed ability and there are no formal programs which operate on a regular basis to deal with students of extreme ability (at both ends). The responsibility for this is left up to the individual classroom teacher (supported by the head of department). The challenging of these students depends on the experience and competence of the Form 3 teacher. But often it is the third form classes which have non specialist teachers and this poses serious problems in terms of challenging all students to meet their potential.

There is no disagreement that students should be working at their own level of ability, but there is some debate as to how that should happen. In many of the high schools around the country, to insist on students working at level 4 would be unacceptable, as many of their intake would only be comfortable with level 3. This is certainly true of some of the schools in this survey. It is, however a further justification for an assessment across the transition which informs the high school of the progress of each student in each strand of the subject.

Many of the intermediate respondents had no clear understanding of how the high schools worked and what they did with the information. It is clear that there is very little information of this type which goes to the feeder schools to enable the teachers there to prepare the students for the change into high school. The reason for this is in part, that the intermediate approach is multi-curricular and teachers do not tend to have subject specialisation, but also because the only information gained about what happens in the high schools is often from those ex-students who return for a 'chat' and this can be a slightly skewed. One such student commented "we dropped back a level".

It is disappointing to observe that there is very little, if any, communication from the high school back to the intermediate school the following year. This is one of the ways of fine-tuning the system to enable the school to collect that information which is most useful. It was agreed by most of the high school respondents that this ought to happen but many excuses are proffered as to why it didn't happen, the most common of which was time, but this would really tend to suggest that high school administrations do not see this as important nor do they see the potential benefits for the subject teachers.

A smooth transition into high school was rated as very important by all respondents (average of 4.5 on a 1-5 scale), but most said that there were many things that could be done to improve this. One teacher described her aims as:

R1: *I try to make sure they are socially equipped and mature enough to handle peer pressure and other demands on them apart from work.*

Other areas that could be improved were greater familiarisation with the new school and its workings, particularly the changing rooms each lesson, acknowledgment of the information that has been passed on, planning programmes that recognised the learning that the students had already done, that is, not all at the same level and it is important not to repeat work already covered. One respondent suggested that the intermediate schools should not tell their students that they are working at Form 3 level, because in his view this was not always the case and there were a number of ways these students could be extended laterally at the same level into work they had not done before.

Anecdotally there is ample evidence of schools developing their own entrance test in mathematics (and possibly in other subjects as well). Possibly this idea originated from the very traditional schools which had developed a reputation for the fact the students in these schools were rigidly streamed on mathematics ability. These schools would argue that if these same tests were administered to the Form 3 cohorts year after year, the school would be able to gain an accurate picture of their students' ability. This has relied on the stable and long-serving nature of the staff in these types of schools. There is

certainly some truth in the statement, that teachers can gauge the ability of an incoming cohort, relative to previous cohorts through professional judgments based on a common entrance test.

However these tests generally do not reflect the national curriculum and there seems no real intent to do so as this would remove the element of comparability with previous years. In practise these tests are little more than tests of basic skills and are based on the ideas that a number of experienced mathematics teachers have deemed as important for the students to have mastered by the time they enter high school. In some cases these tests tend to under value the teaching that has taken place in primary and intermediate schools and can add to further alienation between schools across the transition as it implies the view that “We know best how to assess these students because we have been doing it for years”.

From anecdotal evidence these tests appear to only be used as a streaming mechanism for the high school and after the students are placed in classes the results of the tests are not considered again. They are implemented while the students are in their Form 2 year, once the student has identified that they plan to enter their school. This is done so as to provide the data prior to the student entering the high school and also so that valuable Form 3 teaching time is not given up.

It seems there is a need for some sort of nationally recognised test which would give schools a profile of their incoming Form 3 cohort. Currently the only test which gives an indicator of mathematics ability is the Progressive Achievement Test. This is standardised and is nationally recognised but it does not indicate achievement by strand or level of the national curriculum. While there are other tests being developed, none have the reliability or credibility of the PAT and therefore are seen as inferior even though they may provide more detail in relation to the national curriculum. One of the respondents expressed the desire to have such a test.

R2: *... perhaps a nationally designed diagnostic test. I know the PAT test is archaic, you don't use calculators, you don't do problem solving but where else is a nationally provided objective test that is going to assess where the students are at?*

I: And if we all have our individual tests, how does that help us compare where our students are at?

R2: *It doesn't.*

I: Do we need to compare nationally?

R2: *If we are going to talk about level 3,4 and 5 nationally, yes we do. Should this be done on a national level? Yes but not just at one level!.*

The concept of a transition point assessment was the motivation for developing the Assessment Resource Banks in mathematics and science (Croft et. al., 1996) however it soon became clear that the scale of this project would make it not possible to be used as a national testing device but rather, by sampling, provide some feedback of student success to the schools.

5.4 School reports

Almost all schools are aiming to change the nature of their report forms within the next year. Currently all but one of the schools surveyed are not reporting student progress in the strands of the national curriculum and this school is indicating within each level the student progress for each strand on the basis of A, B or C. In some schools there is no clear intention of reporting in the curriculum strands, for to do so would require formal assessment to substantiate the report indication. The report forms currently used range from a traditional style with minimal space to indicate anything other than the bare

essentials through to the comprehensive report which allows comment on a whole range of areas both academic and non-academic.

For those schools who are indicating a change is needed to their reports, the reason for change cited is that it does not reflect the national curriculum. There seems to be a dilemma for the schools that want to change their report to reflect the national curriculum but do not wish to report in the levels. On the one hand they wish to report against the national curriculum and the most sensible way of doing this is to report the levels being achieved by the students in each strand. On the other hand if they only indicate general progress in each strand this may not be significantly different from their current position, that is, only the category descriptors have changed. But if all schools were reporting against the levels across the transition then student progress would be clear for all to see and the transition from one school to another would become transparent. Apart from the assessment issue, there seems to be some reservation about the response from the community to a report indicating levels of achievement. In a number of school communities the parents would not be aware of the strands let alone levels, and so to indicate both of these on a report form may at this stage not be helpful in the communication with the parents.

However, there are some schools which have made substantial progress in informing parents of curriculum changes, the curriculum framework and the concepts of strands and levels. If the high schools subsequently do not capitalise on this, believing that the parents only expect a simple report, then much of the impetus will be lost, and there will be some disillusioned high school students and parents.

At the other end of the spectrum was a respondent (not a supporter of the national curriculum) who said:

The strands are very skills based and skills are only a part of the involvement. I like to report on students making progress in terms of their confidence, to use

mathematical things, and part of it is skills, they do have to learn some skills, but I am more concerned with their improvement in a general sense.

To show improvement he gets the students to map their own progress. But in the end he accepts that he would have to assess against the national curriculum as that is what we are required to do. But for him reporting in the strands is not an option as the division of the curriculum into strands is very artificial in nature.

This view is one which is probably not untypical of high school mathematics teachers and is in stark contrast to the enthusiasm of the intermediate and primary school teachers. For many high school teachers the issue of the curriculum level at the entry into high school is largely an academic one. The policy in these schools is that the curriculum levels taught at a particular year level are such that students are to be prepared for School Certificate in Form 5 and then Bursary in Form 7. The course that students undertake at Form 3 level is essentially determined by the senior school courses, which has been the case for many years. For those experienced teachers the identification of which levels are involved is a superficial process and the course taught has not tended to change in content (although some of the process may have changed).

In one school the parents were recently surveyed regarding what they would like to see in the report. Their requests were not more detail about the curriculum levels and strands but more along the lines of how was the child coping socially and identifying strengths and weaknesses so that the parents could be more focussed in their support of the school. In other schools the intention is to grade each of the strands on the formal report (although how this is done is more difficult to determine), but in the parent-teacher interviews the intention is to discuss the detail of the curriculum framework and the levels at which the students are learning.

5.5 Levels of achievement

Although the Australian profile is much more specific in its definition than the New Zealand counterpart, with strand organisers which seem to flow from one level to the next as a consistent and logical follow on, it does seem possible that the division of the content material into levels may not necessarily be perfect nor correct. Indeed McGraw (1995, page 41) describes the process of identifying incorrectly placed objectives and subsequent modification to the allocation of objectives to levels.

In New Zealand, the decision as to which level each objective was to be placed was made initially by panels of recognised, experienced and quality professionals in each curriculum area. A draft curriculum was distributed to all professional organisations. The final curriculum statement was the result of the feedback to the draft version with, in most cases, only cosmetic changes. It may well have been that the policy driving the curriculum framework and that the urgency of the time frame may have lead to the apparent minimal changes from draft to final version.

The question of the accuracy of placement of objectives at particular levels remains. Are the levels to be regarded as arbitrary divisions, in a sense transparent to the curriculum, or was there some philosophic reasoning to the division of the curriculum content into levels? If the answer to the question is arbitrary, then the significance of any conclusions which can be drawn from them is also arbitrary and therefore inconsequential. If there was a philosophic rationale for the division, as is generally agreed by most, how can we know if it was correct? Has there been any recognition of the possibility of error in this regard or for the opportunity to “fine tune” the curriculum as in the Australian case mentioned earlier? Has there been any research into how valid the division of a curriculum into levels is?

There exists philosophic difference between schools on either side of the transition in relation to the value of determining the levels of students in each strand and in relation to the ease of determining this. On the one side the intermediate and primary schools all

seem to be very enthusiastic about adopting new curriculum statements and assessing against it. Even though these teachers, primary school teachers in particular, have had to implement other new curriculum statements concurrently, a task which some would baulk at, they have whole-heartedly adopted the curriculum statement and have become positive advocates of it.

By contrast the high school view tends to be one of frustration and a perception of lots of hard work to change old schemes to reflect the new curriculum. There seems little enthusiasm to spend much time determining the level of student in each strand, other than to please outsiders that the legal requirements are being met.

This difference of philosophy stems from the differing nature of the institutions. For the primary and intermediate schools the Form 2 year is the pinnacle of the child's pre-high school career. It is therefore important to them that they are able to say that the student has reached particular levels in each strand. For the high school, however, the Form 3 year is but a start toward its pinnacles of School Certificate, Sixth Form Certificate and Bursary, some would argue that these are of much more value to the student. The high school curriculum seems to be driven by the desire to have students perform well in external examinations in the senior years. To this end many see the chief aims of the third and fourth form courses are to prepare students for their examination years. High school teachers have become quite proficient therefore in working backwards to determine what is required in these years and this does not depend on determining the levels according to some arbitrary scheme. Perhaps this is why there has been some reluctance of high schools to adopt the concept of levels as described in the national curriculum document.

It is disappointing to see that many high school teachers have not seen that the process of identifying the level may be a way of diagnosing students' ability and therefore could help in determining a more suitable learning programme for students.

It is now recognised by most professionals that determining the curriculum levels in each strand, while a nice concept, is difficult to do. The primary and intermediate teachers speak quite confidently of being able to do this without much difficulty. However, when questioned further, they describe their assessments more as “gut feelings” because they tend to know what the students can and cannot do. They cannot provide a categorical way of determining these levels for their children. The high school teachers generally say that there is not a lot of meaning that can be attached to such an assessment and therefore have been reluctant to do this.

5.6 A profile of mathematics achievement

Unlike the experiment referred to earlier, (section 2.4.3), a number of intermediate schools are trying to use a profile as a way of providing information to hand on to the high schools. There were two distinct models being used in the schools surveyed. The first was a document being used in a full primary school, in which all the curriculum achievement objectives were listed for levels 1 to 5 in at least two subjects and the teachers tick and date when a student has mastered a particular objective. This document accompanies the child as they progress through the school and is currently being handed on to high schools. The mathematics section of the document is 6 pages and the entire document has the potential to be between 30 and 40 pages in length. The other type of profile has two pages for mathematics (one of which outlines the objectives in each strand for levels two to four). On the first page a small table showing each strand running across levels 2 to 5 and teachers draw a continuous line through each level, dating at particular milestones, so that a line drawn in the number strand 80% of the way through the level 3 column would indicate a student almost ready to approach level 4 work. As further work is mastered the line is extended across the page. It is intended that this document like the first example will be handed on to the high schools in place of the blue card at the end of the year.

The initiative for using a profile concept has largely come from the Primary Mathematics Adviser who was also involved in the experiment mentioned earlier. The benefits from this are substantial as it is clear that once the teething problems have been sorted out in using the mathematics profile, it will be possible to apply the same process to the other curriculum areas. In fact most of the intermediate teachers in this survey could see the benefits from this concept. It is perhaps a little ironic that the Primary Mathematics Adviser has been too busy to attend regional Mathematics Association meetings where the main theme was the transition from intermediate school to high school. If there were ever to be a positive link between the two systems, this was the opportunity to motivate teachers into some action. It should be noted that from this meeting two teachers, one from a high school and the other from an intermediate school - involved in the experiment, put together a survey to go to all intermediate and high schools in the regions asking them to indicate how important the objectives at the beginning of each strand are to them. Sadly, there was only about a 30% response to this survey casting doubt over any conclusions that could be drawn. Secondly the objectives chosen from the national curriculum were too wordy to be of any value in this context and should have been simplified to enable teachers to respond easily.

5.7 Assessing against the achievement objectives

This, in essence, is the major difference between the intermediate and high schools. On the one hand intermediate schools claim that it is relatively easy to do and can apply it to other curriculum areas concurrently. On the other hand high school teachers are saying that it is very difficult to do because of the large number of objectives and also because there is little gain for them in doing so. However each of these claims deserves further investigation.

In the intermediate, and more particularly full primary, schools several factors need to be considered. Firstly, for the levels covered, the number of objectives per level to be assessed against is fewer than in the high school. Secondly the primary and intermediate

teachers often work with their students for a large portion of each day and in this way get to know how well they are performing and what they are capable of. Thirdly the role of the teacher tends to be different in the primary and intermediate schools. The teacher is less the 'up the front instructor' and more the facilitator to enable groups to work together and in this way has more time both to observe the students as they work and to deal with individual students as the needs arise. Fourthly the nature of the program is different to that in the high schools. Students are encourage to use a variety of resources, actively doing things in their learning which applies equally to all subjects, discussing and cooperating with others as they do so.

In the high school there is not general agreement as to the level at which students should start their mathematics. There are a large number of objectives to assess against and recently (March 1995) the Ministry of Education has acknowledged this and suggested that school select a range of objectives to assess against. Students in high school have either 3 or 4 hours mathematics leaning per week and it is with a different teacher than for the other subjects. High school mathematics tends to be more traditional in the mode of operation with still a lot of 'chalk and talk' instruction. This implies that all students are at the same point where they need this sort of input which in a mixed ability class is highly unlikely. The result is that many students lose interest after the fun and explorative nature of intermediate school learning. Others are not up to the point where the teacher assumes them to be and cannot follow the work, become convinced they are a failure often causing behavioural problems. In both these cases students are certainly underachieving. In addition many of the high school mathematics classes are text-book based, whereas the intermediate work is not, and further even though working in groups is encouraged in the high schools, students are expected to work individually for much of the time, encouraged by such things 'first in class' awards. All these issues are, of course, compounded if the student lacks self-confidence and is in the lower half of the class with fellow students racing through the work, and often the work set is at a level beyond the student.

While it would in a sense be desirable to indicate that a student has mastered level 4 geometry and should now be working at level 5, there are some practical issues which need to be resolved in the process of arriving at this conclusion. As there are 8 objectives in level 4 geometry, just how many should a student show mastery in to indicate that they should now be working at the next level is open to debate. The intermediate teachers are quite confident in being able to identify the levels at which their students are working, but when challenged as to how they arrive at this conclusion, they have some difficulty in substantiating their decision and often put it down to 'gut feeling' otherwise known as 'professional judgement'!

Inherent in this whole discussion is the premise that progression through the levels of the national curriculum is a linear process where the students start at level 1 and leave the school system at a level above 4 (generally) having met certain criteria along the way to indicate that they have progressed up a level. Both Howe (1994) and Irwin (1994) argue that there are serious flaws with this argument and Howson's questions "What does it mean to have achieved a level? If this cannot be clearly stated, to what are the levels contributing?" are certainly pertinent. Irwin suggests that if the levels are there for motivation there should be more of them to enable students to see their progression through the system.

From one of the respondents in addressing the issue of gaps when students go from a level 4 based programme in Form 3 to a level 5 based program in Form 4:

R1: *The spiralling curriculum tries to deal with that a bit. You don't just jump to the next level. The levels are overlapping - there are bits of thinking that are required that are both level 4 and level 5 within the same problem.*

I: Could you say that a student was at one level one day, and having mastered the objectives at that level then move on to the next level the next day?

R1: *No. I don't know what level any of the students are at.*

I: How would you go about finding out?

R1: *You'd make up an absolutely thorough diagnostic test. There would be about 5 questions on each objective and I'd want them to be getting at least 4 out of 5 to say that they have mastered that level. and you've got to be careful about the questions you ask. There are a whole range of difficulties at level 4 for a particular objective.*

I: There are implications for your teaching programme if you at the end of Form 3 indicates that large gaps are missing, there are implications for Form 4?

R1: *Yes, but I don't think that there is enough students who have not reached the level.*

There are several implications of this response. First, this school has a success rate at school certificate (if that is deemed an appropriate standard by which one can measure success) of about 55%, that is, 55% of the students entering School Certificate pass. This is very similar to most other high school in the country. This means that there are large numbers in Form 5 that are not succeeding (by this standard). The School Certificate syllabus is based on level 6 of the national curriculum and the consequence of a 55% pass rate means that it is most likely that the students that did not succeed would not have mastered some of the level 6 objectives and indeed they may still only be capable of achieving at level 5 or even 4. So for this respondent to make the claim that there are not enough students is probably made by comparison to his perception of the national average, whatever that is.

The second underlying issue relates to the diagnostic assessment task. There is genuine concern in the high schools about the inference that because a student has shown mastery in a particular area on one day then the must be given credit for it henceforth. There are so many variables relating to student performance that this philosophy will if implemented lead to students having a false understanding of their own ability. It was

for this reason that the respondent suggested a range of questions on each objective which would show if the student could master the concept or not. The problem with such a proposal is that it is not manageable either in terms of writing, administering recording or maintaining.

Another respondent addresses the importance of identifying the curriculum levels of the students:

R2: *Formally, I see little value in it other than satisfying the ERO [Education Review office] and the likes, because again, they really are artificial constraints and students could well be in algebra, or some similar topic, over a range of levels just depending on the context, but informally we do look at where students are at, and we try and challenge them through the context of what we're doing rather than by just making it another level up.*

I: When the third formers come in do you give them a diagnostic test?

R2: *No, the last thing we want to do when a third former starts is to give them a test.*

I: How do you assess where they are at?

R2: *I would still do it reasonably informally, but also earlier on I would give them a range of activities, applied activities, to try and see what they can do, and how they can use the knowledge that they've got.*

I: By doing that are you able to make a reasonably accurate assessment of where they are at?

R2: *In terms of levels and their achievement you can make some assessments. I'm really not too concerned about making too many formal assessments. I would still rather provide activities that provide for a range over time and when I have*

tried to put students in a particular box in a certain place I always find the next time I do the same test or try and box them in a different one, so that would be the way we would do it. Ideally, we would like to ensure that all activities give scope for kids to work in a range of levels.

I: If it were desirable to identify the curriculum levels, what would be the difficulties in doing that?

R2: *Well it's very much contextual depending on the type and context you give them it would determine whether a student achieved at that level or not to a certain extent. I would devise the easiest possible way for our staff to do it, because it's just another bureaucratic thing to do which I imagine would be a test with one question for each level and after they had been here for a few weeks you might give them a test, tick off the boxes they have done that time and give them a similar test next year at Level 3 and hope to show that we're ticking off more boxes. Again I don't believe it's the best way of doing it, but it's the easiest.*

In relation to the third form intake he says:

R2: *Our third form programme is grounded in level 3. Our third form modules that I have set up give a range of things at Level 3 and 4 objectives because it is a national legal document. ... The third form would start at Level 3 and there would even be, at some times, a Level 2 activity in there, not many though, and some of it would go through to Level 5, but not much, it certainly wouldn't go much further than Level 4 and the idea would be that we give the students a range of contexts. In the fourth form it starts really at Level 4 and goes through.*

I: If you knew where the students were at in each of the strands, would that be helpful?

R2: *Yes it could be okay, but I still think it wouldn't change our programme very much, because it doesn't hurt the good students to give a Level 3 task and say, 'man that was easy' and move onto the next one, but it means that all the students are fundamentally starting at the same place and you're not grouping them too early.*

I: Does that imply that the work done by the intermediate school is not necessarily useful?

R2: *I think the intermediate schools should concentrate on recording and writing down things for their own purposes and not worry too much about what's further down the track. If they wanted to do something really useful for us, they could summarise it in half a page instead of giving five pages.*

This view is perhaps a little extreme, but not without support. It indicates the naive attitude that some high school teachers have in terms of what their students have achieved prior to their entering high school and it also highlights a fundamental difference in operation between the classrooms of the high school and intermediate schools, that in the intermediate schools students are encouraged to achieve at their own levels whereas this is much more difficult in some high school classrooms.

When probing the intermediate teachers as to how they determine the level at which a student is working, there are three distinctly different responses. The first relates to a series of units that were developed in conjunction with two of the schools in this survey, the Mathematics Adviser and another intermediate school in the province. What was produced were a series of assessment booklets with tasks from a variety of sources which would be suitable to assess the curriculum objectives at levels 2 to 5. In order to indicate at what level a student is working in each strand, they proposed to use these assessment tasks to identify the appropriate level. One of the teachers explains:

R3: *At the end of each unit we strike a level. For say geometry we split it into 2 chunks. At the end of the first one we do what we call a best fit level. We have to have an understanding of what a level 4 understanding is. To do that we use Topic Based Maths [the material written in conjunction with other schools] which has been indexed to the national curriculum. We have kept TBM right out instructional usage and the teacher at the end of the unit will go through this booklet and pick out a series of questions at different levels and form those as their assessment activities, give them to the children and will say this child is consistently handling adequately level 3 questions.*

But just how many questions at a particular level need to be answered correctly was not clear from this interview and the researcher was not able to see an exemplar assessment task.

Another response was as equally vague and related to “knowing the student”. One respondent describes it this way:

R3: *But it is a tricky one to say whether they should be definitely on level 3 or level 4. ... It comes down to knowing the children which in this situation, seeing them everyday in the classroom, you know what their ability is.*

One gains the impression from this that the teacher has an instinctive feel both for the curriculum and for the students and their ability. How, then, can the teacher claim that the students have gained mastery? On the basis solely of observation and knowledge of the child? There is no doubting the sincerity and integrity of the teacher, but this must be a very difficult position to substantiate when asked to provide the evidence of the levels that are indicated by this process.

It is also not surprising that there is ample potential for students in this situation to gain a false impression of their achievements, then enter a high school which has been provided with potentially misleading information. This would also give the cynical high

school teacher the evidence for the claim that the intermediate schools are not competent in teaching and assessing mathematics.

Another respondent, referring to pre-tests and post-tests claims

R4: *My students get freaked out in test situations, and those tests don't get completed in one lesson.*

It is not surprising that these students find the formal testing situations of the high school quite difficult to adjust to.

A third response involved reference to a diagnostic handbook designed by the Auckland Advisory Service (Auckland Advisory Service, 1994). This is a book with a series of questions in each of the strands of the national curriculum at levels 2 to 5. In the view of the researcher there are several flaws with the book in the way it was compiled. Apart from the errors in the answers, not all the objectives are assessed but, more importantly, the mark sheets at the end of each section divide the questions in to a number of themes spanning several of the levels. These themes are not directly related to any specific part of the curriculum and appear arbitrary. The net effect is to provide a way of recording information based on the national curriculum but not in a way that would allow the user to determine the specific level of achievement for a group of students. This is a document, produced in 1994, which was certainly headed in the right direction but has left users bewildered and perplexed in terms of its usefulness, because it does not quite do what the user would like it to do.

Although the document has been updated to remove errors and inconsistencies it still does not allow teachers to gain a definitive understanding of the level a student has or can achieve. The book may well be useful in other ways but for this purpose it is not a complete solution.

For those teachers, particularly in the intermediate schools, who are busy implementing a number of other curriculums as well, this appeared to give them some information which would assist them in the placement of their students. However, most (including those who tried to use it in high school) have found it wasn't the complete answer and, but caused some frustration in dealing with the detailed recorded information. There are still some teachers that in attempting to determine the levels of their students, do not appear to have fully understood the issues and are prepared to make a judgement on the basis of instinct as to the level of their students.

Inherent in the idea of being able to determine the level in each strand of the curriculum are the notions of progress and degree of difficulty. For this progression to be natural the division of each strand into levels must reflect that for algebra as an example an objective at level 4 is more difficult than an objective at level 3 and so on. There is some discussion about whether this is always the case for every level and each strand. It would not be surprising if this were the case because of the way in which the curriculum was set up. The committee with the responsibility of writing the curriculum document discussed this very issue at length and in the result reflects a combined decision as to where in the curriculum each objective fits. It is most unlikely that, even with a draft edition, they were absolutely correct in the placement of these objectives. If this were a serious issue what perhaps should happen is a revision of the curriculum statement. It might be concluded that since there seems little national call for a revision that the writers were right, but there are other factors that are involved.

There is a substantial cost involved in the revision of a national curriculum statement, and given that the Ministry of Education is currently still working on the first draft editions of curriculum statements in other essential learning areas, there would be significant resistance to a revision without strong and real reasons. Secondly the wording of the objectives is such that they do not necessarily specify a particular skill and therefore comparison of objectives across levels becomes a little "fuzzy" and harder to justify.

However if it true that some level 3 objectives are more difficult than some level 4 objectives, and there is some anecdotal evidence to support this, then there may not be a clear progression through the levels in each strand. If this is so then attempts to measure progress through the levels of the curriculum are invalidated. There would then be no sensible conclusion that could be drawn from progressing from level 3 to level 4.

5.8 Attempts to determine levels in each strand

As described earlier, the intermediate and primary teachers seem much more comfortable with this concept than their high school counterparts. However when questioned further to clarify just exactly how they do it they have to admit that professional judgement has a great part to play in the decision.

Another factor that was mentioned by a number of respondents was the uncertainty of what “being competent at level 3 in geometry” means. Using this as an example there are eight objectives for level 3 geometry. “How many of these does the student need to be competent in before they are regarded as working at level 4”, is the question that some respondents were struggling with.

There are many objectives from the national curriculum which are not very specific. An example of this is the first level 5 objective in measurement:

Within a range of meaningful contexts, students should be able to:

- Find perimeters, areas, and volumes of everyday objects (including irregular and composite-shapes), and state the precision (limits) to the answer;

Within this objective there are at least the four concepts of perimeter, area, volume and precision. The document [Mathematics in the National Curriculum] then describes of the following page some suggested learning experiences. These include: finding the perimeters and areas of rectangles, triangles, parallelograms, trapezia, circles, composite shapes, and irregular shapes; finding the volumes of cuboids and the prisms, cylinders, cones, pyramids and spheres.

The difficulty faced mainly by high schools, as level 5 applies mainly in this area, is that of assessing a student against this objective. How many of these concepts which make up the achievement objective above are required to be met in order to say that the student is competent with this objective? Those schools that have attempted to do this gave generally identified a number, say 10, of the most important skills here and then claimed that if the student can master at least 7 out of these 10 then they have competence in this objective. As there are no clear guidelines from the Ministry of Education, it is possible that each school will interpret this slightly differently and thereby casting doubt on this objective as a national standard. The problem becomes more complex if intermediate schools offer level 5 to their students. Will they be as competent and consistent in their judgement of student achievement? There are no easy answers to this question. For the lower levels of the curriculum there are less objectives for each level and they are more specific. It is therefore more likely that assessments would be easier to construct and the results more accurate.

In some cases the respondents were committed to the process of determining the levels at which the students are working, because that is school policy, and the method being used is not accurate enough to be able to ascertain the level with any degree of certainty.

One view encapsulates the problems of trying to determine the levels of achievement for each student:

I find it really hard. I try and be as specific to the national curriculum and think do they do that most of the time? But a fair bit of it is a gut feeling. Its hard in

that there is such a broad range of behaviours at each level. I find it hard: Do they have to have got through every single objective, tick, tick, tick yes they have. And they are level 3 for sure but when do they become level 4? I take a bit of a punt and if they are generally, mostly doing those things adequately then I operate in that level.

What this means in practise is not at all clear, although it would be fair to say that this respondent would probably have a quite detailed understanding of the ability of the students in their class. What this statement does reflect is that we should not be looking at the national curriculum as finite chunks, called levels, which when the student masters they move on to the next chunk or level. But rather the content of the levels overlaps and meshes together in such a way that within each strand students could be working with concepts at a range of levels and hence determining the precise level that the student is working is quite difficult. This respondent suggests that for a given concept we provide a range of questions covering a range of levels and as a result the student works at the level where they are consistently and comfortably showing success and understanding.

The Ministry of Education argues that the assessment process should not dominate the teaching and learning processes but rather it should be an integral part of the teaching and learning. It was recognised that some schools may be over assessing students, assessment against objectives, and the Ministry clarified its expectations:

Schools should ensure that their programmes provide coverage of the achievement objectives. Schools need to use professional judgement in selecting which objectives students should be assessed against and reported on. To attempt to assess students continuously against all the objectives would be unmanageable for the teachers, and would risk over-emphasising assessment within teaching and learning.

Ministry of Education, 1995, page 1.

A much more manageable method to determine the levels of student ability in each strand is suggested by Winters and Hall (1997). They have produced a complete kit which can be handed to a Form 1 or a Form 2 teacher and allows them to determine the level at which each student is working. This process requires about ten minutes for each student and Winters claims that schools have been more than comfortable with the requirement of an additional teacher to do this.

Essentially they have identified an important concept in each strand which has some continuity through the levels. They have written questions which reflect the difficulty in this concept for each of levels 2 through to 4 and then, on the basis of the students performance, they have identified the level at which the student should be working in each strand. They have trialled this kit extensively in the local area and report that teachers seem confident in using it and that the results are worthwhile. It is a simple test which overcomes the complexities of assessing against all the objectives at each level and at the same time gives a reasonably accurate indicator of the ability of the student.

They claim that schools, particularly intermediate schools, are using this kit to measure their students at the beginning of each year and thereby giving a measure of the progress being made by the student. They also plan to extend the kit to involve levels 5 and 6 in order to make it useful to high schools. While the primary and intermediate schools do not seem to have a problem with the use of another person to administer the tests there may be some problems getting funding to enable a person to administer such tests to a full Form 3 cohort.

There is anecdotal evidence of high schools focussing on only a few objectives at each level, as Winters and Hall have done, assessing against these and then using as the basis to determine the level of the programmes in their school. Even though the conclusions may not be entirely valid as they ignore a substantial chunk of each level in each strand, this idea seems eminently more manageable and the conclusions entirely satisfactory.

5.9 The Education Review Office and the national curriculum

The Education Review Office is an independent governmental agency which has as one of its purposes to monitor the effectiveness of the delivery of the New Zealand curricula. Teams of personnel from the ERO review each education provider on a regular basis. The model being used in this process for measuring the effectiveness of a school is a constantly changing one as it evolves from observation and input from those involved. One of the current ideas which seems to have increasing use is that of adding value to a student's education.

If a school can show that at a given point in time a student was deemed to be at a certain point along the curriculum and at some stage later the student was further along the curriculum, then the school could be seen as adding value to this student. This is seen as most desirable by ERO and seems to be the review teams now look specifically for evidence of "value added" education.

This is a crude model for measuring school effectiveness as there are so many other factors which affect the student's learning. None of these are measurable or even recognised. To imply that the school alone is responsible for improving a student's learning is very limiting and therefore to measure a school's effectiveness on this basis may not give a true reflection of the value of the school. However it is seen as a way of monitoring the national curricula, particularly now that we have integrated curriculum documents spanning all pre-tertiary years. It is relatively easy to show improvement in this model, but the sceptics would question the conclusions which can be drawn from it.

In order to comply with ERO requests, as this is a legal requirement, some schools are picking up on the idea of assessing students against the national curriculum objectives in the beginning of Form 3, and Form 4, and then measuring them at the end of the year. In this way the school can say they have "added value" to the student, the student can feel good about their progression and records of assessment can be kept from year to year.

These schools are using a series of tests which have been written for levels three, four and five of the curriculum and are comprised of a question for each objective which is either right or wrong. The tests are not brilliant or commercially marketed but reflect an ongoing attempt to assess against the national curriculum objectives. In this way the school gets a profile of each student at the entry into the high school which can be used for streaming or for identifying the diagnostic needs of their students. While there are some limitations to this idea it does give an overall impression of what the students are capable of. In some schools the information provided in this way has become more important than the information provided by the primary and intermediate schools. These schools suggest a number of reasons for this; the information provided is uniform and consistent, it relevant to their teaching programme; and it forms the basis of the measuring required by ERO.

5.10 The Seamless Curriculum

This is a concept which was articulated by a previous minister of education and flows from the fact that one curriculum statement spans all the pre-tertiary schooling. It is therefore possible for students to progress through the curriculum at their own rate and not be constrained by the school structures in which they are learning. In this way primary school students could be learning at intermediate level, intermediates at high school level and high school students learning at tertiary level.

A number of respondents had not understood the meaning of the concept and instead spoke of the spiralling curriculum. They described the learning of mathematics like a spiral – getting wider as the knowledge increases and each time around the spiral the student consolidates concepts learned earlier and develops them further (wider).

Those that did recognise the ideal nature of the concept spoke of the practical limitations of such a model. One respondent was a bit more perceptive than most and describes a much wider picture:

R1: *Taking the child and spiralling them up and building their knowledge as they grow and it doesn't too much matter physically the place they are at as long as they are building on their base. For intermediates with a two year age range its tricky because we should be doing a lot more of what I was expecting the high schools to do. We should be looking at the primary schools and what they have been exposing the children to so that we have perhaps a clearer what those children have been doing. We build on that and that goes on to the next step. The intermediate-high school transition is possibly a little bit more crucial because of the development that goes on, the specialisation.*

I: You would expect students to be at a whole range of levels in a particular class?

R1: *Yes.*

I: Does this happen in reality or do we keep them together?

R1: *Yes [we probably keep them together] because of resourcing , books and time, timetabling, sanity. The bottom students are dragged up and they just cope.*

Some of the respondents who understood the concept describe what they saw as the most practical way of dealing with students at different levels. This effectively involved some form of streaming whereby students of like ability were placed together in order to motivate and challenge each other to perform at high levels. The limitations of class sizes and timetable restrictions were mentioned as possible restrictions to being able to do this.

Several respondents mentioned that in an ideal world the student would be able to move to different campuses to study different subjects at different levels with those who were at the same level. An example of this might be a Form 2 student sitting in a school certificate class at high school. However the realities of this make this a less feasible option for most, although it does occur in some schools in some specialist subjects.

5.11 The differences between the schools on each side of the transition point

There are major philosophical differences between the schools on each side of the transition and these impact on the effectiveness of the transition for the form two students.

The majority of learning in primary and intermediate schools occurs in groups where the students are encouraged to physically go and explore a particular topic. In these situations there is discussion and interaction between the group members so that all students participate and those that latch on to new ideas quickly can help those that learn at a slower rate. In this way all members of the class participate, feel valued and have some ownership of the groups' achievements. Many of the activities in which the students are involved are multi-curricular and therefore cover a range of objectives in a number of essential learning areas.

By contrast, the learning in high schools tends to be much more individualistic and competitive in a much more controlled environment. Students in many high school mathematics classes are encouraged not to move around and to not share their work and the focus is on what students can achieve by their own efforts.

In the primary and intermediate schools students are assessed in a variety of ways and for a variety of purposes. In the early years of a child's learning it is not helpful to indicate that a student is not achieving in lots of areas but rather the assessments can enable the teachers to measure improvements in the students progress. These assessments may not be formal and may take place while others are working on other things in the classroom or even in another room. They may even be made in a group situation. In this way the teacher's assessment of the student's ability can be very subjective, but provided that, in the professional judgement of the teacher, the student is making progress there is little concern for the nature of these assessments. The teacher in these situations has a good understanding of the student's ability because they have

been working with the students for the whole of each school day. A consequence of this is that if a student or group of students do not complete a section of work in any subject, the teacher can rearrange the programme for that student or group of students to catch up the work at a different time. Often students have strengths in one curriculum area with weaknesses in another and when the student has completed a task in the area of their strength there is often time to go back to the other areas which need attention. In this way the teacher can ensure all the students can master a minimum standard appropriate to the ability of the class.

By contrast assessment in the high school is predominantly by pen and paper type tests where the student works on their own. The tests cover work that the majority of the class has been working on recently (the degree of difficulty is most likely to be determined by the students of average ability in that class) and may indicate that some students have not mastered the concepts. There are some attempts made to address these deficiencies to help these students 'catch up' but the rest of the class continues on with the scheme of work. In this way students who fall behind often get further behind as they may require more time to master the basic concepts, by which time the others in the class have moved on. Without the assistance of other helpers or teachers the high school teachers are not always physically able to meet the needs of all the students in their class because of the numbers of students and the pressure to complete the scheme of work for the year.

5.12 The ideal environment for learning mathematics

There is a substantial difference in the lists in tables 11 and 12 between primary/intermediate and high school respondents to this question. This reflects the different nature of the institutions as described in the previous section. Several statements stand out as significant and pivotal to the successful learning of mathematics.

- R1: *Your staff and where they are at and their attitude. Getting the right people and getting them up to speed. A change from students in desks in isolation, with one text.*
- R2: *The least possible range in ability of students, to have a range of resources. Recognition of the fact that intermediate teachers are teachers of many curriculum areas. Time is an important factor. The terminology of strands and levels was a challenge.*

The issue of the lack of appropriate and suitable resources was a common observation. Perhaps this reflects the fact that the national curriculum is not as specific in detail as previous syllabus statements and that it may be harder to identify from the curriculum statement what is required at each level. It was the intention of the writers of this document to produce general statements of achievement rather than specify detail, but unfortunately many teachers have found the change difficult because it has meant them develop their own resources and there is some suggestion that the Ministry of Education should have provided more support for the implementation of the curriculum statements.

Chapter 6 - Conclusions

6.1 Communication between schools

On the basis of the survey carried out for this research it is evident that the contact between the schools across the transition point is neither adequate nor sufficient to facilitate a smooth transition for students into high school. There appears to be a number of significant factors involved.

On both sides of the transition there is general ignorance of the procedures and programmes of each other. It is significant that for a number of the intermediate and primary respondents the only contact they had with a high school was when they were a student. In these cases the experiences of high school mathematics were not positive and as this is the only contact with high schools their perceptions of what happens at high school are not very accurate in the current environment. Very few of the high school respondents had any detailed knowledge of what happens in intermediate and primary schools, although most would readily accept that there is a lot of good teaching that goes on in these schools.

There seems some uncertainty as to who should initiate the communication between the schools. The intermediate and primary schools would argue that if the high schools want their cooperation then they should initiate the communication. When this has happened on an informal basis, these attempts were greeted with some degree of cynicism. The high schools would argue that if the intermediate and primary schools want more contact they should request it or initiate it.

For many high schools in New Zealand the number of schools from which their third form students come is quite large and often there will be only a few students from a significant proportion of these. High schools tend to focus any personal contact with a small number of schools which provide the bulk of their students. For the remaining

provider schools the contact is by telephone or paper. The main reasons cited for this are practicality of physically getting to each provider school and the proportionate cost of doing so. For the primary and intermediate schools the Form 2 students may go to a range of high schools, although the number of options is much smaller than previously described for high schools. This diversity is often compounded by the small size of the Form 2 cohort in the primary schools where there may be only a very small number going on to each of a range of high schools, but where intermediate and high schools are on adjacent properties there is significantly less diversity of both Form 2 going on and Form 3 coming in.

From the curriculum context (with particular reference to mathematics – although it would probably be true for other subjects as well) the contacts made by the high school with the contributing schools is made by people who, in most cases, will not be teaching these students in their Form 3 year. This means that the information provided, either anecdotally or in written form, is not owned by the Form 3 teachers and therefore is not generally regarded as significant. If all the Form 3 teachers were involved in this process, there may be a difference in this area, but cost and practicality are factors that would be against this.

The main factor driving any contact that does happen seems to be expediency. The contact tends to be initiated by the high schools for the purpose of collecting data about prospective enrolments and once the enrolment procedure has been completed and the student arrives at high school, there seems to be very little contact after the transition. The exceptions seem to be the schools which are on adjacent properties, although even this is limited.

Coupled with expediency is the desire for advertising of the high school. The first contacts that are made by the high school are usually senior staff with a focus to sell the good features of their school in a competitive environment. Subsequent contacts, if and when they occur, tend to focus on the collection of data for the purpose of class placement. These purposes do not seem to be clearly visible to provider schools. It

almost appears that the emphasis is on getting some evidence together to establish the students transition path and minimise the chance of the student going to another high school.

The process of high school staff contacting provider schools and its purpose seem to not be clear to a number of high school respondents who either don't know or aren't too worried about not knowing. It is of some concern that some heads of department do not know much about the detail of the process.

6.2 The Documents in the transition

Historically the formal compilation and transfer of detailed information about students from Form 2 to Form 3 originates from the legal requirement that all schools complete the blue record card. In recent years the legal requirement for this to happen has been removed in order to recognise the diversity of methods that schools may wish to employ as a way of providing information for the high schools.

For those who advocate that this card serves a useful purpose, this record card is a standard form which can be used for easy comparisons and can allow for details in a range of subject areas. With some minor modifications to page 2 it could be used to provide details of student progress against the national curriculum.

However there is now an increasingly popular view that this record card is not sufficient to report all the details that primary and intermediate schools would like. As a consequence there is a diverse arrange of ideas and documents being produced to better reflect the achievements of the students as they complete Form 2. The primary and intermediate schools are saying that they know these students quite well and want to provide an extensive description of what they can do and have achieved in a wide range of activities including the essential learning areas where the measurements are against the levels in the curriculum statements. They would argue that this cannot be effectively

done with the blue record card (one double sided A4 sheet) and are producing documents up to 30 pages in length.

In addition most high schools require primary and intermediate schools to complete a general information sheet about the students coming into their Form 3 classes. It has been argued that the information on this form, also a double sided A4 sheet, provides the basis for class placements and groupings of students. This is partly because it is more general, even anecdotal, and also because it is in some cases the only sheet of information that comes with the student, if there is no blue record card.

There seems to be a major misunderstanding in purpose of the documentation that is handed on to the high schools. Irrespective of the use of such documents there seems to be a proliferation of different and very detailed documents from the primary and intermediate sector whereas the requirements for initial placement into high schools seem to be brief and very general. The subsequent use of such data is, in most high schools, not clear but certainly not extensive. In addition there exists a general ignorance amongst high schools as to the direction that primary and intermediate schools want to take in terms of reporting to the high schools. Many of the high school respondents were only vaguely aware that there could be some useful information about the abilities of their Form 3 students and less sure of where this information was stored.

As mentioned previously one of the biggest single issue affecting the usefulness of the documentation is the large number of provider schools each producing their own documentation effectively independently of what the high schools require. For the high schools some of their Form 3 students come with extensive profile documentation while others come with just the blue record card and some come with nothing. This may have been what prompted the use of the brief general information sheet mentioned previously in order to get some standardisation of data. There are three natural consequences of the diversity of documentation that the high schools receive. The first is that of consistency. The high schools want to make comparisons of student abilities for the purposes of class placement but find this difficult because of the range of detail provided. Secondly there

are storage problems with excessive documents (particularly for large high schools) and thirdly the high schools tend to be suspicious of the professional judgements of the intermediate and primary schools thereby undermining the value of any documentation.

On the other hand intermediate and primary schools, recognising the limitations of the blue record cards, want to produce a document that better reflects the ability of the students and which also reflects the national curriculum. Without clear direction as to what is required by the high schools, this is a very progressive move and one which should be recognised as such. In order to produce such documentation the primary school and intermediate school teachers are spending inordinate amounts of time collating, preparing and writing at a stressful time at the end of the year. Sadly the downfall of this system is the fact that there is such a diversity of intermediate and primary schools each with a different view of what they think is important to hand on to the high schools that the diversity causes some confusion as to what can be done with the resulting documents.

The second issue is that of ownership of the information. As the Form 3 teachers have not generally been involved in determining what information would be useful to collect for them and as the information provided by the transition process varies in detail and may be only general in nature, there is little evidence of the Form 3 teachers using the transition data in any positive and constructive way. This begs the question of the purpose of the data and certainly adds cynicism to the primary and intermediate view that what has been written is not used.

The third issue is that of the differences between the schools in their implementation of the national curriculum. The primary and intermediate schools have whole-heartedly embraced the new curriculum as part of a whole school change incorporating new curriculum statements in each of the other essential learning areas. It is therefore not surprising that the new approach would produce new documentation to reflect the changes made in the schools. However high schools have been more reluctant to adopt the national curriculum and therefore there appears to be some professional jealousy and

perhaps even distrust of the resulting documentation. The high schools are then confronted with the problem of what to do with this documentation which is ahead of the progress that they have made and therefore does not fit easily into their programmes.

Historically schools, primary , intermediate and high schools alike, have placed strong emphasis on the role of ability testing in the form of either the Progressive Achievement Test or the Test Of Scholastic Aptitude. Neither of these relates specifically to the national curriculum and there are computer programs that will analyse the results of these. However if the main reasons for collecting this data are for class placement and showing “value added” to students then one must surely question their relevance and usefulness.

There are those who argue quite strongly that the entry into Form 3 allows for a fresh start for all the students. It means that the students come into a class where the teacher has no pre-conceived ideas of that they are like and where the student has the opportunity to begin with a positive focus and as result may produce work which may not have been expected if their previous performance had been passed on. This view does not seem to foster good relations between the high school and its provider schools as it implies that “we are the best people to ascertain the students ability” and it also suggests that all the assessment that was done by the provider schools is of no value. Perhaps this view is driven by bad experiences of communications from provider schools. There is ample support for the view that the information supplied by the provider schools is not particularly useful or accurate, but this should not imply a complete distrust in the process but rather a desire to improve the process in order to better facilitate a smoother transition for the students.

6.3 Suggested ways to improve the transition

There are a number of ways in which to improve the transition from Form 2 to Form 3. However all of these suggestions are based on the assumptions that it is important for

students in this transition process to have as smooth a transition as possible and that it is desirable to make improvements on the existing procedures. They also require additional time and effort and therefore extra funding.

It would be most desirable for all Form 3 teachers to observe on a regular basis teachers in intermediate schools and/or primary schools. It would be most desirable if these were observations of teaching in the same subject areas. Likewise it would be desirable for teachers of Form 2 to observe teaching in Form 3 classes and to be exposed to the organisation of the high schools. It would also give the Form 2 teachers the opportunity of observing the progress of the students they had the previous year. To enable this idea to work, it could not be driven by restrictions in costs because if this were to happen what most schools would end up doing is swapping teachers. This would not work as what is required is the opportunity to observe in another environment and then reflection on personal practises.

There would be additional benefits from this. One would be that the Form 2 teachers would be able to better prepare their students for the transition into high school. The students would be more prepared for the social changes but also their teachers might also be able to ease them into high school style mathematics. Secondly the Form 3 teachers may be able to apply some of the teaching strategies in their own classrooms, or at least be able to relate to the reasons why the students respond in the ways they do.

There needs to be a lot of thought given to exactly what data is required by the high school and what it is to be used for. In order to do this it would seem sensible that representatives of the high schools get together, as there are generally fewer of these than primary and intermediate schools, and determine what they require and for what purposes the data is to be used. This would probably be best done on a regional or provincial basis. As a result it would be possible to generate a standard form for the collection of information to be passed on to the high school. However, in order to determine what information is important the representatives should consult widely with the various departments in the school and take cognisance of the current practises of the

provider schools. In this way they are likely to produce a form that both meets the needs of the high schools at present and in the near future but it also gives the provider schools recognition for their work and guidelines to which they can work. In order to get agreement on the nature of the data to be collected the provider schools must be involved and then informed of the nature of the form and for what purposes the data is to be used. If this was done on a regional or provincial basis then all high schools could expect consistent and useful data to be supplied for all students entering their school (except those from out of the area). Likewise the provider schools would know in advance what was required and for what purpose it is to be used. In this way they would feel that their contributions were valued and useful in the process, but also they could tailor the general comments that they might otherwise make so that they might be more useful to the high school.

It would be desirable to involve the teachers of Form 3 in the process of collecting the data from the provider schools and not just the senior staff and guidance staff. In some cases the Form 3 Deans go out as well but it would give added credibility to the process if practising Form 3 teachers were also involved. This would also help to build some continuity for those students that move on to those schools. While it is recognised that not all the teachers of Form 3 would be able to be involved in this process it is certainly possible to involve a significant number. This would also serve as professional development for these teachers.

There needs to be regular opportunities for the teaching staff from all institutions to interact and share ideas. These should be of a social nature in order to build up trust and confidence in each other in order to foster open and sincere channels of communication. The venues for these meetings should vary so that teachers from all institutions do not feel threatened by the environment.

After the students have been settled in their Form 3 classes there should be meetings arranged to report back to the provider schools. The details reported back should include reference to current class placement and why, what information was particularly useful

and what information could be of use in the future. This process is critical for the refining of the process which should be an ongoing activity.

6.4 *The nature of the schools*

There are significant differences between the schools on either sides of the transition which need to be recognised if the transition process is to be smooth and effective. These differences relate to school management, classroom management and curriculum delivery.

In the primary and intermediate schools the students have one teacher for all their subjects (although in some schools mathematics is treated differently) and therefore the teacher is able to gain a very accurate picture of the strengths (and weaknesses) of each student. There should be no doubt about the validity of the assessment of the ability of a student made by a teacher in this situation as it reflects the summation of a year of working with the student and few should question the professional judgements made. By comparison high school teachers see their Form 3 students for three or at most four hours per week. It is still possible to get to know the ability of these students over the year, but the intermediate and primary school teachers see the student performance in all areas of the school life and are therefore able to make assessments of the relative strengths and weaknesses of a student on this basis. This reflects the holistic approach to learning that occurs in primary and intermediate schools where the teacher is a mentor in more than just the curriculum sense but also in the social and physical sense as well.

Much of the learning that takes place in the primary and intermediate classrooms is in groups where each member is valued and supported by the others. Consequently assessment is often of individual effort within the context of the group. These groups may be mixed in ability or of like ability but whichever is the case the teachers role is more of a facilitator working with the group and perhaps offering suggestions rather than always telling and instructing.

By comparison the high school environment is more competitive and individualistic. There are some teachers who prefer students to work in groups with others but the focus is still on individual learning. The gaps between the more able groups and the less able groups tend to widen and there seems more reluctance for interaction between the groups.

The assessment methods in primary and intermediate schools are much less formal than the high schools. In many cases the assessment in primary and intermediate school is individualistic and designed to show what the student can do rather than what they cannot do. It may be part of a group assessment or it may even be by observation of the student or group of students. By comparison the high school assessments tend to be whole class and in written form. For many students these tests are new, much harder and may not be at a level suitable for them and therefore these students start to experience failure, according to tests which are presumably set to the middle ability group in a class.

If the student is to make a smooth transition into high school then these factors must be recognised and high school programmes adjusted accordingly. The teachers of Form 3 students need to be much more aware of the nature of the learning in the previous year and acknowledge the professional judgements that the teachers in those schools are made. Only then will the students feel completely comfortable and the transition process will become transparent.

For many in the intermediate and primary schools there is one further significant difference between themselves and their high school counterparts. Currently they two groups of teachers have pay structures negotiated by two different unions. Traditionally primary and intermediate school teachers have been paid significantly less than their high school counterparts. This probably originated from the fact that many primary and intermediate teachers had no formal qualifications whereas this was regarded as a prerequisite for high school teaching. There are now very few teachers in any sector with teaching qualifications and there is therefore no reason for primary and intermediate

teachers to be paid less. Currently the New Zealand Educational Institute, primary and intermediate school teachers union, is negotiating, along with the high school union, to achieve a unified pay structure which recognises equal pay for equivalent position and experience. This is a somewhat contentious move and until it is resolved (in their favour) the primary and intermediate school teachers will be reluctant to participate in any major initiative with the high schools.

6.5 Levels of achievement

The introduction of the New Zealand curriculum was a brave, radical and innovative concept. It has both its critics and supporters, but to overhaul the entire pre-tertiary curriculum in such a short time frame was at best ambitious and at worst unrealistic. Hindsight has shown that some of the original concepts are unmanageable and the reporting of student ability against the curriculum levels is only now being investigated as teachers become more confident with the curriculum and framework.

The writing of curriculum statements for each of the essential learning areas to cover the whole pre-tertiary education seemed to be driven by a desire to streamline the implementation of the school curriculum and also to more easily allow for the possibility of a student studying a subject or strand within a subject at their own level. It is this process that has led to the concept of a seamless education, one which is founded on the idea that a student studies at their own level of achievement regardless of the type of school in which they are learning. This concept, though nice in theory, has been much harder to implement as it has meant that the primary and intermediate schools may have students studying into the senior high school level. In mathematics they did not have the subject specific confidence of competence to justify this. The other possibility is for students to be moving to another school for that subject, but this too was not that practical as it revolved around timetabling problems.

The division of the mathematics curriculum into levels has caused some difficulty in implementation. There appeared no justification as to why some concepts were placed at particular levels and there are some learning objectives at the same level that are much harder in concept than others at the same level. In addition there is some doubt about the fact that the levels are necessarily sequential in achievement. When first implemented there was no supporting documentation or ideas on how to assess against it or the achievement objectives. This is a situation which has not changed, a sharp contrast to when the equivalent curriculum statements were introduced in Australia, where the teachers felt they had a lot more support on how they were to implement these new ideas.

It is on the issue of the curriculum levels that there is most difference between the schools before and after the transition into high school. The primary and intermediate schools initially found the concepts involved in a national curriculum divided into strands and levels quite different from what they had been used to and quite a challenge to become competent and confident with. It may well have been the initial struggle that, having overcome it, has given them the confidence to apply themselves to the curriculum statements in the other essential learning areas and thereby become very conversant with the national curriculum framework. As a consequence the strands and the levels are now common place in classroom planning and assessment. The primary and intermediate schools have more readily accepted the concept of a seamless curriculum, even though they may not be able to implement it as they would like. They recognise that a national curriculum statement divided into levels of achievement allows them to measure the progress through the curriculum of their students and that this information can be passed on to the teachers of the next year in order to allow the student to continue on in their learning with the transition being ideally transparent to the process.

The high schools, although probably much more involved in the process of setting up the national curriculum, have been much more reticent to accept the value it brings as a national document which brings together all learning in mathematics prior to the tertiary

level. From the high school perspective the national curriculum was much more vague than previous curriculum statements as content statements were much less definitive. There was also a much greater emphasis on the mathematical processes than in previous statements. High schools also found the concept of a level spanning several chronological years different and more difficult to deal with than previous curriculum statements.

For high schools to assess against the achievement objectives in the national curriculum was a much more difficult process because of the need to first clarify what each objective meant. It is only in recent years that high schools are now looking at this issue, but are still finding it a challenge.

What seems to be at stake in the high schools is not the level at which the students enter but the level they which they require for school certificate, sixth form certificate and bursary. It is these “high stakes” qualifications which seem to be driving the curriculum in high schools and then the schools work backward to identify what needs to be taught in order to get the students to the levels required first for school certificate and then further qualifications. In this regard the high schools seem to be saying that it is their intention to bring the majority (at least of 80%) of the students up to school certificate level by the end of Form 5. This is irrespective of what the students have achieved so far and how far they are along the progression of the national curriculum. This view has been guided by the view that to enter school certificate is absolutely critical for all students and this view is also one which is fostered by many parents. Many schools have pass rates of approximately 50 to 55% i.e. 50% of the students entering school certificate achieve a pass – where a pass is deemed to be 50% or more in an external exam. This means that a substantial number of our students are not experiencing success in mathematics (according to the school certificate criteria). It may be that these students were not ready for study at this level.

There is a lot of good teaching, and learning, that takes in high schools, and it is a sure thing that in many case the students are brought up from the level at entry to high school

to the levels required for school certificate, however there are many students whose improvements are not sufficient or who started high school at a level beyond where they are at and therefore floundered in a subject they were otherwise good at. High schools have not yet capitalised on the fact that intermediate and primary schools are in a position to indicate how far along the national curriculum the students have achieved, and that this could be useful in determining the appropriate level for their programmes at Form 3.

Herein arises the problem of the credibility of the professional judgements of the primary and intermediate school teachers. What is to be made of the statement “this student is working at level 5 in geometry”? The intermediate and primary teachers would regard this as a definitive statement about the students ability in geometry, but the high school teachers would not accept the statement as definitive and would most probably proceed to teach the child at level 4. Their arguments put forward to justify this are based around the fact that the provider judgement, if correct, would most likely have been made in a restricted context and in another context they might only be able to achieve at level 3.

If there were to be a curriculum profile for each student leaving Form 2 indicating the levels in each of the strands of each essential learning area then there would need to be much more communication between the schools as to how this would be done, against which objectives to assess and for what purposes it would be used. Perhaps the process of the communication between the schools itself would be a sufficient reason to do this irrespective of what is finally produced.

Chapter 7 - Implications and suggestions for further research

The issue of a smooth transition is clearly recognised by schools, communities and to some extent by the government as most desirable for our Form 2 students. The government has acknowledged that as a result of the 'seamless curriculum' students could be at a range of points through the curriculum and has suggested that transition point assessments be used as a way of monitoring the effectiveness of the new framework. However these transition point assessments have not developed as originally thought and consequently there is now no national check on how students are progressing through the curriculum.

While the government recognises that a smooth transition is desirable there seems some reluctance to put any resources into developing a functional model of what could happen. Instead schools and communities are being left to cope as best they can and as a result there are a range of schemes being developed with a range of success rates. If the government were to spend time analysing the process and developing resources and providing time, guidelines and support for schools the transition would be far more effective.

There are several issues raised by this research which warrant further investigation.

While there are a number of attempts to assess against the objectives of the national curriculum and then determine the appropriate level of the student, this researcher has not seen any that would be accepted universally across the country. It would be worthwhile to survey schools to find out if they see this as a desirable practise and whether they would use a nationally developed resource. If it was seen as desirable to develop such a resource than this should be done in conjunction with all school sectors involved, developed nationally and available free of charge to all schools.

There has been no research yet done on the appropriateness of the divisions into strands and levels. It would be worthwhile investigating how schools are using the divisions into levels and whether they think that they are at the right points in the curriculum. While it has not been the intention from government through the national curriculum framework to specify the levels students ought to have achieved at given stages, perhaps this deserves some attention. It is noticeable that the statements clarifying this in the draft document were removed and made much more 'fuzzy' in the final document. This might give some clarification to schools as to what they can expect of their students. It might also be worth investigating the reasons for and the effects of levels covering several chronological years.

It would be desirable to develop a model of good communication between schools for the purpose of transfer between schools. This may have already exist in some parts of the country but it would be a good idea to identify how such a system can work and what the rewards would be for participants. In relation to this it would be worthwhile identifying, on a national basis, what information would be required by the high schools and perhaps produce an improved version of the blue record card. Part of the model could include methods of providing feedback after the transition which could involve timing, personnel involved and the content of the feedback.

Job sharing (assuming pay parity) could be investigated to determine the feasibility of how teachers on one side of the transition could be usefully involved in the other side and hence improve the awareness of each others needs.

As most schools keep computerised records of their students, an investigation into the feasibility of electronic transfer of data would be worthwhile. This could involve the transfer of personal details as well as any data relating to curricular achievement.

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Appendix 1

The blue record card

E19/16C

PRIMARY PROGRESS RECORD, SENIOR SCHOOL

Name _____ Surname _____ First names (underline name known by) _____ Boy/Girl _____

School _____

Date of birth ____/____/____ Date entered first school ____/____/____

This card is CONFIDENTIAL to the person concerned, their parents, teachers, and officers of the Departments of Education and Health.

ATTENDANCE	Class	Teacher's signature	Date	Principal's signature	Date
	F1				
	F2				

INFORMATION FROM THE MIDDLE RECORD _____

HEALTH AND WELFARE FACTORS Medical Psychological _____

ADDITIONAL NOTES FOR SECONDARY SCHOOLS	CURRICULUM
	LANGUAGE (listening and speaking) _____

PERSONAL AND SOCIAL DEVELOPMENT	LANGUAGE (reading) _____

	LANGUAGE (writing) _____

MATHEMATICS

SCIENCE

HOME ECONOMICS

SOCIAL STUDIES

WORKSHOP CRAFT

PHYSICAL EDUCATION

ART

HEALTH

MUSIC

Appendix 2

A Secondary Assessment Profile

Secondary Assessment Profile

Pupil E2L Stage: 1 2 3 4 Date / /

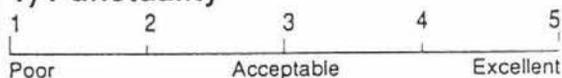
Form N C Year Subject

Gender M / F Medical Teacher

Please consider the child's behaviour and learning over the past month and then circle a number (1 - 5) on each continuum (eg Poor - Excellent) where you assess the pupil generally to be.

Please underline any of the example words, or if you want, add any of your own, which describe or indicate the areas of the pupil's difficulties or abilities.

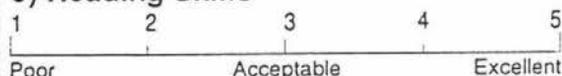
1) Punctuality



2) Attendance

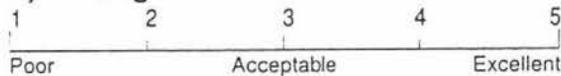


3) Reading Skills



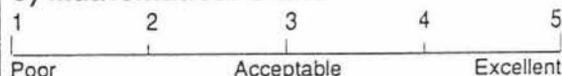
(1) Beginner, (2) Non-fluent, (3) Moderately fluent,
 (4) Fluent, (5) Exceptionally fluent

4) Writing



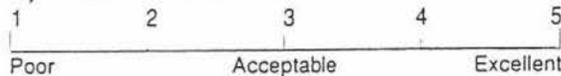
Illegible, Untidy presentation, Non-fluent

5) Mathematical Skills



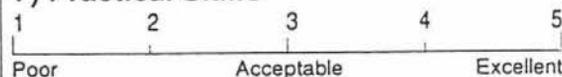
Operations + - \times \div , Tables, Using a calculator,
 Decimals, Explorations

6) Artistic / Creative Skills



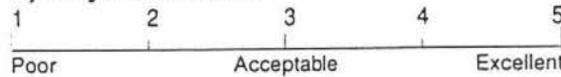
Visual, Dramatic, Music, Written

7) Practical Skills



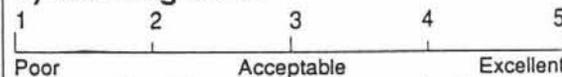
Fine work, Using tools and equipment

8) Physical Skills



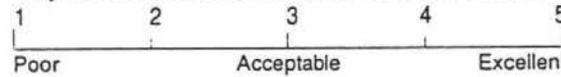
PE and Games, General coordination

9) Learning Skills

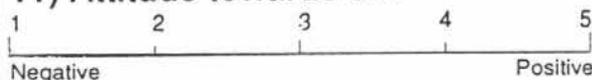


Concentration, Memory, Making connections between ideas, Individual work, Group work, Collaborative work, Distinguishing between class situations and 1 - 1 situations with teacher, Starting work, Finishing work

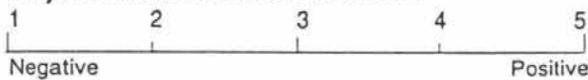
10) Communication and Social Skills



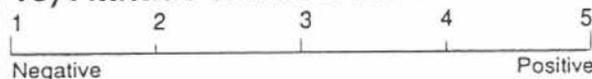
Communication with adults, Communication with peers, Leadership skills, Isolated, Unwilling to join in, Making friends, Working with others

11) Attitude towards self

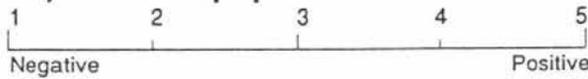
Blames self, Seems to feel incapable, Poor self-image, Seems unhappy / tearful, Withdrawn, Depressed, Makes negative statements about self, Over-confident, Self-satisfied

12) Attitude towards work

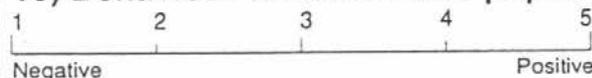
Reluctant to start, Poor presentation, Unfinished work, Destroys or damages work

13) Attitude towards school

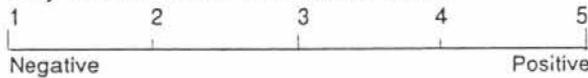
Destruction of property, Graffiti, Truancing

14) Use of equipment and furniture

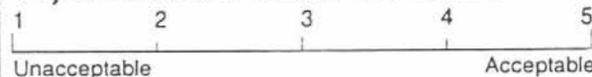
Misuse of equipment, furniture or materials, Failure to bring correct equipment

15) Behaviour towards other pupils

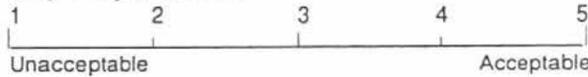
Physically aggressive, Verbally aggressive, Provoking, Distracting, Damages others' work

16) Behaviour towards staff

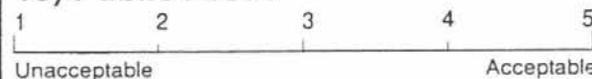
Teaching staff / Non-teaching staff
Physically aggressive, Verbally aggressive, Uncooperative, Cheeky, Undermines authority, Response to commands, Response to reprimands, Specific groups

17) Movement about the class

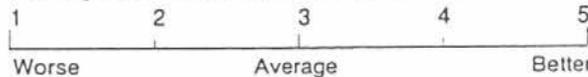
Wandering about, Interfering with others, Leaving classroom

18) Pupil noise

Constant talking to peers, Shouting out, Interrupting teacher, Non-verbal noises - banging, tapping etc. Volume, Frequency, Duration

19) Public Areas

Corridors / Playground / Assembly / Toilets / Office
Physical / Verbal aggression to staff / pupils,
Intentional / unintentional interference with others,
Lining-up, Inappropriate movement / noise,
Misuse of equipment or furniture, Graffiti, Litter

20) How does the pupil's behaviour compare with others in the class?

Please prioritise and briefly describe 2 areas of particular concern:

No. ()

No. ()

Other comments (including positive observations):

Please return to:

By:

Appendix 3 – The Questionnaire

For Intermediate schools

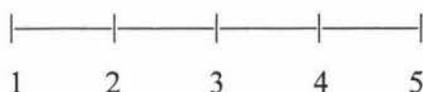
Contact between the schools

1. What are the approximate proportions of your form 2 students which will go to each high school?
Please list these?
2. How many times have you met with each of the following regarding current form 2 students
 - Principal and/or Deputy Principal of the High School
 - Deans
 - HOD's
 - Guidance Counsellor
 - Other types of meeting
3. Do you have any professional contact with the teachers of the form 3 students who were your form 2 students last year?
4. Have you had any other contact? What and when?

Information passed between the schools

4. Do you know what information secondary schools seek from you about the mathematical ability of your form 2 students?
6. a) How is information given to the high schools?
b) What mathematical detail is provided in this way?

7. a) What do you understand the high school does with this information?
 b) Does the high school seem to take notice of the information you provide?
8. a) Do you know how students are placed in classes at high school?
 b) Do you have an input in this?
 c) What information do you provide in this regard?
 d) Is mathematics treated differently/the same as other subjects?
9. Does the high school come back the following year asking for further information?
10. How important is a smooth transition to high school for your form 2 students?

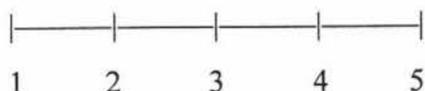


11. Are there things that could be done to improve this?

Issues relating to assessment

12. What is the nature of the form 2 school report and how is mathematics achievement described?
13. Does it reflect the National curriculum?
14. Do you report formally (or informally) on the progress of students in the strands in mathematics to Parents?
15. a) How do you understand the 'seamless curriculum'?
 b) what are the implications for Intermediate schools?

16. What are the difficulties you find in determining the curriculum levels of achievement of the form 2 students?
17. a) What levels are expected before entering high school?
b) What proportion of your students would be at this level?
18. What difficulties do you have in reporting to students about the level at which they are working to give them a fair indication of their mathematical achievement?
19. Do you feel comfortable with the achievement levels spanning several years?



Can you add any comments to explain you feelings:

20. a) What would be an ideal environment to facilitate successful learning based on the 'Mathematics in the New Zealand Curriculum'?
- b) What are the difficulties in achieving this?