



MINISTRY OF EDUCATION

*Te Tāhuhu o te Mātauranga*

# Boys' Achievement A Synthesis of the Data

*Final Report*

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Ministry of Education

Learning Policy Frameworks

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## Executive Summary

### Background

This report provides a synthesis of the findings about the educational achievement of boys in New Zealand. The report updates our knowledge of boys' participation, engagement and achievement in schooling, in particular, secondary schooling.

The results from national and international assessment surveys show that gender gaps in favour of girls are present in reading in New Zealand (and throughout the world). There is also evidence that boys do less well in writing. These skills are fundamental to full participation in a knowledge based society and thus the relative underperformance of boys is of concern. In other areas, such as mathematics and science, the results for boys and girls are similar and, in some cases, boys out-perform girls overall.

Even when boys perform less well overall than girls in a subject like reading, it is not true to say that boys are under-achieving across the board. International and national student achievement studies indicate that the achievement difference within a given gender is greater than the difference between genders. Thus a focus on a range of desired outcomes that recognises the diversity of all learners is more appropriate than one that focuses on a specific group.

The focus of this report is on boys' participation, engagement and achievement at different levels of education.<sup>1</sup> It draws on a wide range of evidence from research, such as the longitudinal Competent Learners Study, national assessment initiatives (for example, asTTle, NEMP) and international assessment studies (for example, PIRLS, PISA, TIMSS), the NCEA and tertiary qualifications.<sup>2</sup> The report focuses primarily on the gender differences of school-aged students but where possible it also examines the role of student ethnicity.

### Key Findings

The data from New Zealand and international studies show that many boys are succeeding at school. In New Zealand this includes boys from all ethnic backgrounds. There has also been no marked decline in the performance of either boys or girls over the last five years. The findings from this report are summarised below:

- Boys participate in Early Childhood Education to the same extent as girls.
- From year 1 to 10 the proportion of boys in school is consistent with the proportion in the general population but from year 11 boys are leaving school at a faster rate than girls.

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<sup>1</sup> The majority of data used in this work is available from the Education Counts website:  
<http://www.educationcounts.edcentre.govt.nz/>

<sup>2</sup> asTTle: Assessment tools for teaching and learning; NEMP: National Education Monitoring Project; PIRLS: Progress in International Reading Literacy Study; PISA: Programme for International Student Assessment; TIMSS: Trends in International Mathematics and Science Study; NCEA: National Certificate for Educational Achievement.

- There is no difference in the rate of truancy for boys and girls, but significantly more boys, Māori and Pasifika boys in particular, are stood-down and suspended; are excluded or expelled; and gain early leaving exemptions.
- Reading Recovery is a programme designed to assist those who remain poor readers after a year of classroom instruction with learning to read and write. At six years old boys are twice as likely as girls to be entered into this programme, with Māori and Pasifika boys most likely to be entered. The outcomes of this programme are relatively similar for boys and girls.
- There are no systematic gender differences in mathematics and science achievement.
- There is converging evidence that girls perform better than boys, across all ethnic groupings, on all measures of reading and writing at all levels of schooling. However, a number of boys in New Zealand read and write well and are advanced readers and writers.
- There is evidence that the reading gender gap reduces over time but increases for writing.
- New Zealand students are found to perform very credibly in reading in international surveys. In most other countries girls also significantly outperform boys in reading, so this is not just an issue for New Zealand.
- The percentage of students gaining NCEA qualifications has increased from 2004 to 2006 but females are more likely than males to gain an NCEA qualification at all levels.
- Scholarship attainment is similar for males and females.
- Females tend to stay at school longer and leave school with higher attainment levels than males.
- Males are more likely than females to leave school with little or no formal qualification but this difference has decreased over recent years.
- Females are more likely than males to leave school with University Entrance or higher qualifications and this gender difference has grown. Māori and Pasifika males are least likely to leave school with University Entrance or higher qualifications.
- The above finding impacts on tertiary education participation with females more likely than males to participate in degree level study, and of those participating, males are less likely than females to attain a degree level qualification.

Synthesis across the data has revealed clear and consistent issues for boys. Generally these relate to the over-representation of boys in statistics relating to:

- early problems in reading;
- disengagement with school;

- lower achievement in reading and writing; and
- lower qualification attainment.

As a first step to improve boys' achievement we need to ensure that they are engaged in, and excited by, their learning, and able to achieve to their full potential.

## Chapter 1- Participation in Early Childhood Education

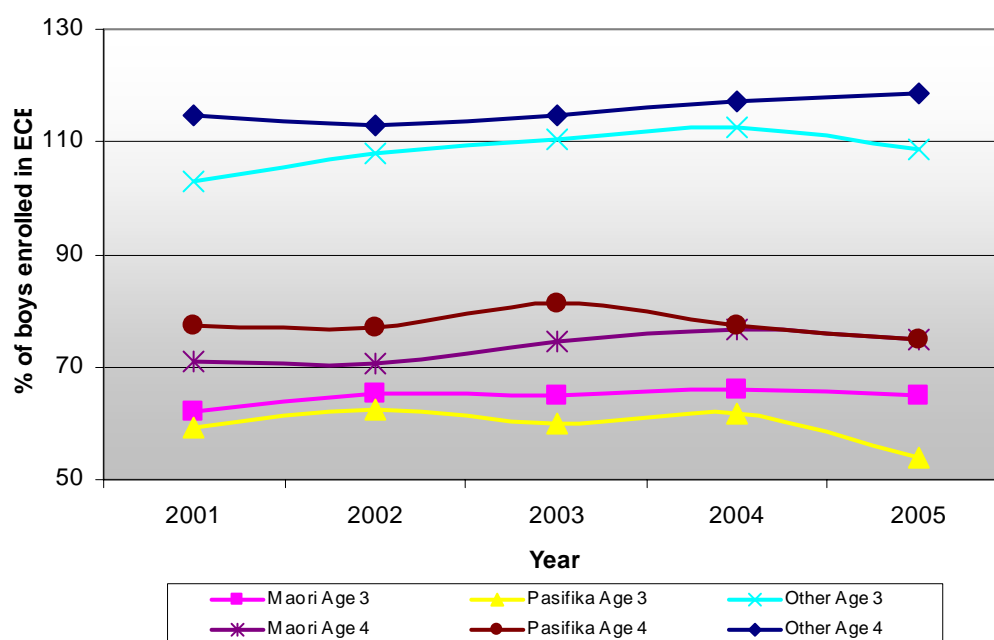
Quality early childhood programmes prepare young children socially, physically and academically for entry into primary education. This chapter explores participation differences in early childhood education (ECE) of three and four year olds.

### Key Findings

- Participation in ECE does not vary by gender.
- Māori and Pasifika students have lower rates of ECE participation.

The apparent participation<sup>3</sup> of three and four year olds in ECE is not related to gender but there are some differences for ethnicity. Figure 1 shows the apparent participation of three and four year old boys by ethnicity in ECE between 2001 and 2005. The apparent participation is calculated based on the number of children enrolled in an ECE service compared to the projected population from Statistics NZ.<sup>4</sup> Māori and Pasifika boys have lower participation rates than Pakeha/Asian/other combined (the *other* category shown in Figure 1).

**Figure 1. Apparent participation of three and four year old boys in early childhood education by ethnicity**



<sup>3</sup> The measure overestimates participation because children enrolled in more than one early childhood centre will be double-counted.

<sup>4</sup> Data supplied by Data Management and Analysis Division, Ministry of Education



## Chapter 2- School Participation

This chapter looks at the gender differences in school participation rates across all school years.

### Key Findings

- School participation rates are relatively stable over years 1 to 10 and reflect the gender ratios in the population. There are proportionately slightly more males than females in years 1 to 10.
- In years 12 to 15 this gender ratio reverses and females are in the majority. This is due to higher numbers of males leaving school in year 11 onwards. Between 2004 and 2005 this translated to around 6,200 males leaving school in year 11.

Table 1 shows the percentage of male and female students enrolled at all school year levels between 2002 and 2005.<sup>5</sup> Male students outnumber female students in the primary years (years 1 to 8) and this reflects the gender ratio in the population. During the secondary school years male students outnumber female students in the junior secondary years (years 9 and 10), in year 11 the relative proportions of male and female students are similar, but in years 12 and 13 female students outnumber male students.

**Table 1. Percentages of school rolls by gender between 2002 and 2005**

Year	% of school roll							
	2002		2003		2004		2005	
	Male	Female	Male	Female	Male	Female	Male	Female
Y1	51.0	49.0	51.5	48.5	51.6	48.4	51.4	48.6
Y2	51.9	48.1	51.0	49.0	51.4	48.6	51.6	48.4
Y3	51.5	48.5	51.9	48.1	51.1	48.9	51.4	48.6
Y4	51.5	48.5	51.5	48.5	52.0	48.0	51.2	48.8
Y5	51.6	48.4	51.6	48.4	51.4	48.6	51.9	48.1
Y6	51.9	48.1	51.7	48.3	51.7	48.3	51.4	48.6
Y7	51.8	48.2	52.2	47.8	52.2	47.8	52.1	47.9
Y8	51.1	48.9	51.3	48.7	51.9	48.1	51.7	48.3
Y9	50.9	49.1	51.0	49.0	51.5	48.5	51.9	48.1
Y10	51.0	49.0	50.9	49.1	50.9	49.1	51.1	48.9
Y11	49.8	50.2	49.9	50.1	49.7	50.3	50.1	49.9
Y12	47.2	52.8	47.9	52.1	47.7	52.3	47.9	52.1
Y13	47.1	52.9	47.2	52.8	47.5	52.5	47.1	52.9
Y14	47.6	52.4	49.1	50.9	47.6	52.4	45.3	54.7
Y15	48.4	51.6	51.1	48.9	51.1	48.9	48.2	51.8

<sup>5</sup> Data Management and Analysis Division, Ministry of Education, (2002 to 2005). Education Statistics of New Zealand.

The reversal in school participation rates in the senior secondary years is due to higher proportions of males leaving. In 2002, approximately 5,000 (61 %) year 11 males and 3,000 (39 %) year 11 females left school. These proportions have remained relatively stable between 2002 and 2005. The data can also be viewed from a different angle, where, in percentage terms, approximately 18 % of male students on year 11 rolls in 2002 and 2003 had left by 2003 and 2004 respectively, compared to 11 % of female students. Of the students on the year 11 roll in 2004, 21 % of male students had left school by 2005 compared to approximately 15 % of female students. Even though the number of males leaving school after year 11 is still greater than females the relative gap has decreased between 2004 and 2005.

## Chapter 3- School Disengagement

Regular school attendance is essential to encourage all young people to stay at school until at least the age of 16 and benefit from being there. This chapter aims to create a picture of gender differences in student disengagement from school by considering information regarding truancy, early leaving exemptions, stand-downs, suspensions, exclusions and expulsions.

### Key Findings

- Truancy rates have increased from 2004 to 2006 but there are no differences by gender. However, the truancy rate is higher for Māori and Pasifika boys than NZ European and Asian boys. This is also true for girls.
- Males are stood-down and suspended more frequently than females. Gender differences exist across all ethnic groupings but Māori and Pasifika students have the highest rates of stand-downs and suspensions and the largest gender difference.
- The formal removal (exclusion and expulsion) of students from school is principally a male problem, with Māori and Pasifika males having the highest rates.
- Males account for 62 % of all early leaving exemptions. Māori males have the highest rate, with 20 % of Māori males granted early leave. Males granted early leave are more likely to go into full-time employment than females granted early leave.

### 3.1 Truancy Rates

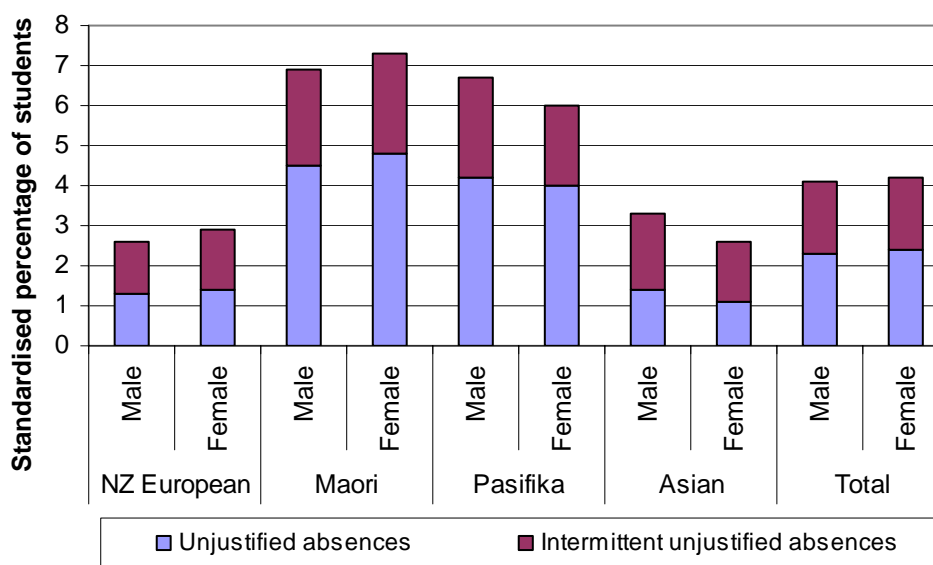
The results of the 2006 *Attendance and Absence Survey* show that both overall absence and truancy rates continue to rise.<sup>6</sup> Nationally, truancy rates have increased from 3.4 to 4.1 % and absence rates have increased from 10.9 to 11.5 % between 2004 and 2006. There was only a slight difference between the overall absence rate and truancy rates by gender. The overall absence rate (including justified absences) is 11.2 % for males and 11.5 % for females, while the truancy rate (including unjustified and intermittent unjustified absences) is 4.1 % for males and 4.2 % for females.

Figure 2 shows the intermittent and unjustified absence rates in 2006 by ethnic group and gender. The percentage increase in all types of absence has increased most marked between 2004 and 2006 for Māori students. Figure 2 shows that Māori and Pasifika students have higher absence rates than their NZ European and Asian counterparts. However, within ethnic groupings there are slight differences by gender. Pasifika and Asian students have the largest truancy gender differences at 0.7 percentage points, with males having higher rates than females. NZ European and Māori students have smaller truancy gender differences but the truancy rates are higher for females than males.

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<sup>6</sup> L. Ng, Research Division, Ministry of Education (2007). *Attendance, Absence and Truancy in New Zealand Schools, 2006*.

**Figure 2. Intermittent and unjustified absence percentages by ethnic group and gender, and 2006**



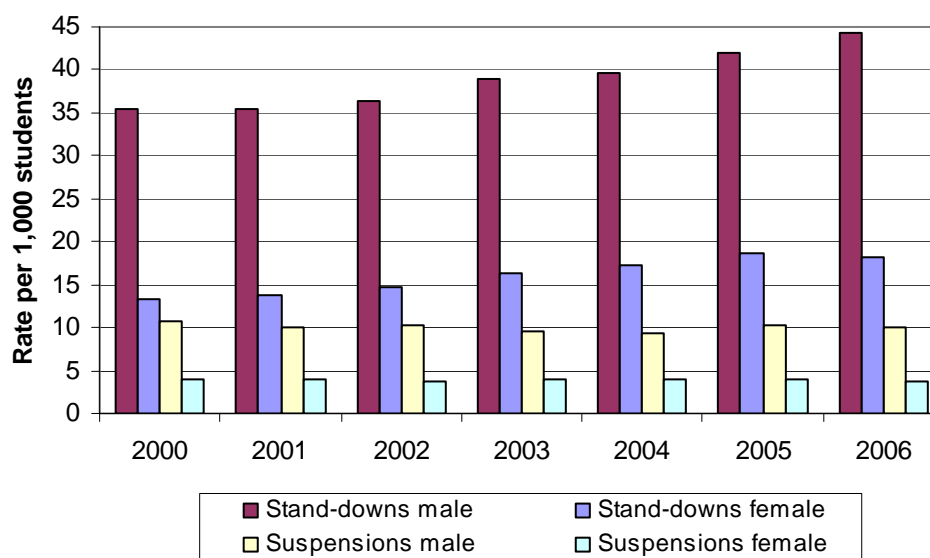
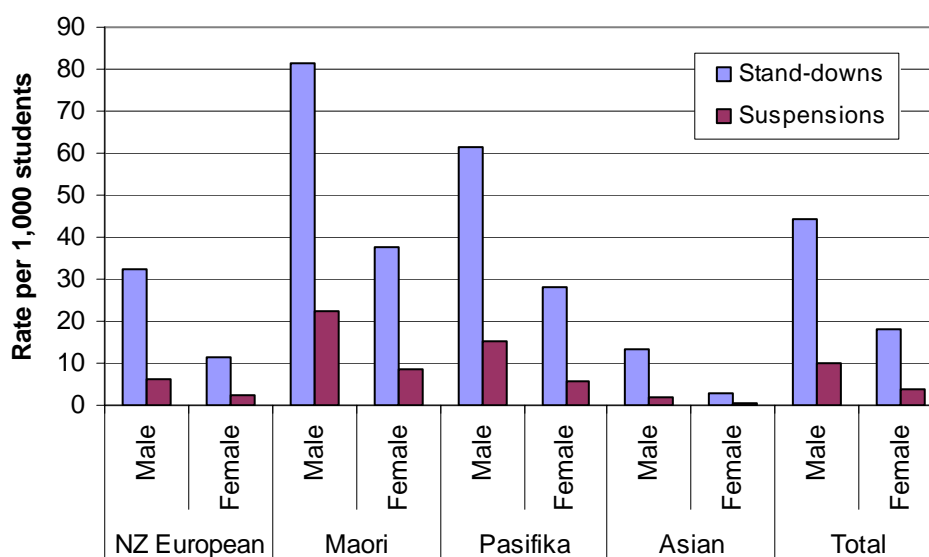
The frequent truant percentages (unjustifiably absent for three or more days within a week) are similar, with Māori and Pasifika students more likely to be frequent truants. Overall, gender differences are not evident but within ethnic groups Asian and Pasifika males have higher rates than Asian and Pasifika females. Whereas, Māori and NZ European females have higher rates than the males.

Analysis by school quintile shows that intermittent unjustified absence rates, unjustified absence rates and frequent truant rates all decrease with increasing school quintile.

### 3.2 Stand-Downs, Suspensions, Exclusions and Expulsions

In addition to students being truant from school, they can be stood-down, suspended, excluded or expelled. Over the last seven years stand-down rates have increased, but suspension, exclusion and expulsion rates have decreased. Figure 3 shows the stand-down and suspension rates per 1,000 students by gender from 2000 to 2006. Across all years boys are stood-down and suspended more frequently than girls, with males accounting for 72 % of the total number of stand-downs and suspensions in 2006.

Māori and Pasifika students have higher stand-down and suspension rates than the other ethnic groupings (Figure 4), but gender differences exist within each grouping. However, across ethnic groupings the gender difference varies. The gender difference decreases in the order Māori>Pasifika>NZ European>Asian. This is true for both stand-downs and suspensions. Physical assault on other students or staff and continual disobedience are the two leading causes of stand-downs and suspensions.

**Figure 3. Stand-down and suspension rates per 1,000 students by gender, 2000 to 2006****Figure 4. Age-standardised stand-down and suspension rates per 1,000 students by ethnic group and gender in 2006**

It is also found that in general, stand-down and suspension rates decrease with increasing school quintile. Male students have a larger spread of stand-down and suspension rates across school quintiles (stand-down rate difference of 39.0 per 1,000 between quintile 1 and 5 schools for males, compared to 19.8 per 1,000 for females and a suspension rate difference of 11.1 per 1,000 between quintile 1 and 5 schools for males, compared to 3.0 per 1,000 for females). The gender difference between stand-down rates (31.1 per 1,000 in quintile 1 schools compared to 11.9 per 1,000 in quintile 5 schools) and suspension rates (10.4 per 1,000 in quintile 1 schools and 2.3 per 1,000 in quintile 5 schools) is found to decrease with increasing quintiles.

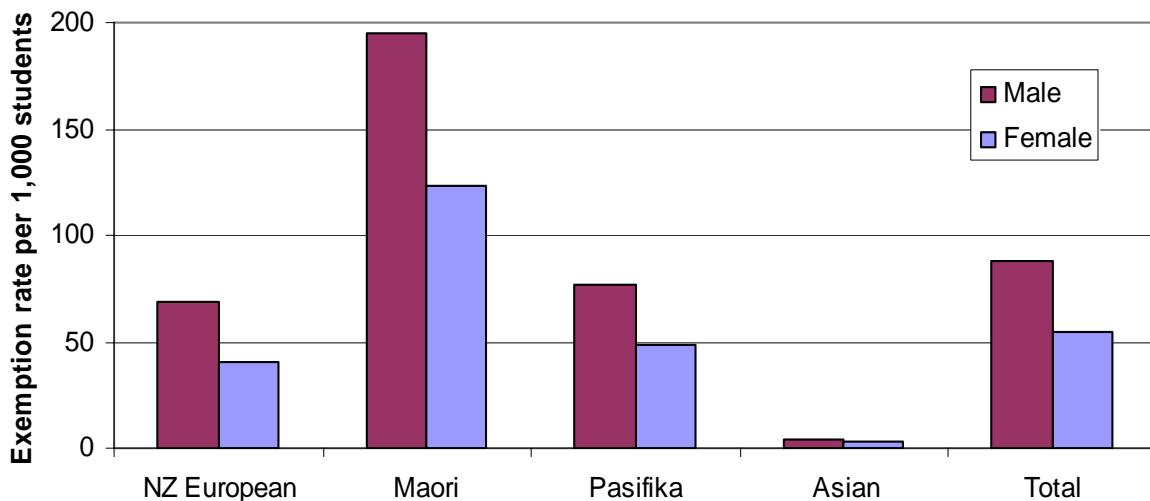
The formal removal of students from school (exclusions and expulsions) is also principally a male problem. In 2006, over three-quarters of exclusions and expulsions are for male students (77 % of exclusions and 80 % of expulsions). Gender differences are apparent across all ethnic groupings, but once again Māori and Pasifika students have higher rates than the other ethnic groupings.

### 3.3 Early Leaving Exemptions

Students can be granted early leaving exemptions at age 15. The *Staying at School* research<sup>7</sup> found that early school leavers appear to have a lot in common, including disengagement, low achievement and a dysfunctional family. Higher proportions of early leavers stated 'push' factors (elements inside the school that encourage students to leave) rather than 'pull' factors (elements outside the school that entice students to leave) as the main reasons for leaving school early.

Figure 5 shows the number of students per 1,000 who were granted early leaving exemptions by gender and ethnicity in 2005.<sup>8</sup> Sixty-two percent of all early leaving exemptions were for males in 2005 with a rate of 88 per 1,000 compared to 55 per 1,000 for females. Māori students have by far the largest rate of early leaving exemptions and the largest gender difference. NZ European and Pasifika students have similar gender differences between early leaving exemption rates, but the gender difference for Asian students is minimal.

**Figure 5. Early leaving exemption rates by gender and ethnic group in 2005**



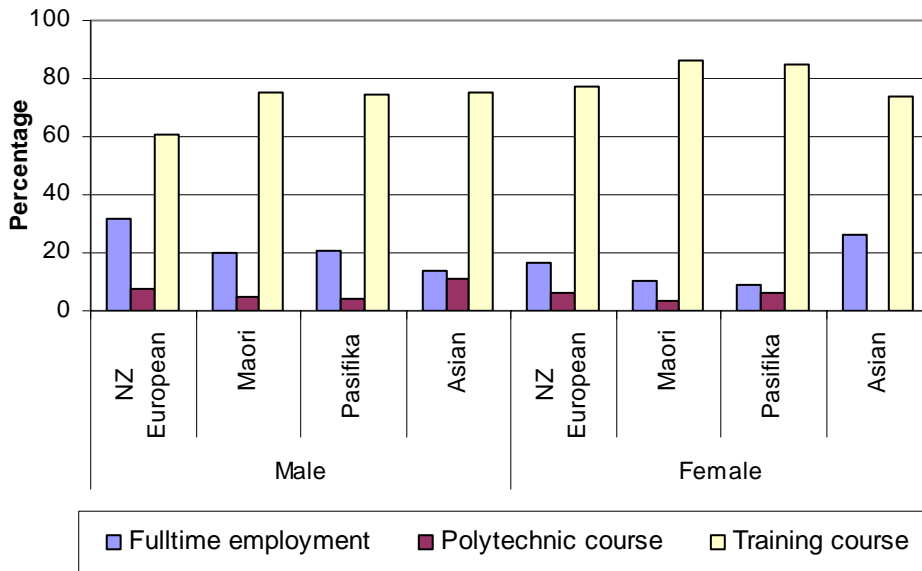
When students are granted early leaving exemptions they have to state what they will be going on to do. The destination of students granted early leaving exemptions by gender and ethnicity are shown in Figure 6 for 2005. Males granted early leave are more likely to go into

<sup>7</sup> Consultation on "Staying at School". (2006). Report prepared for the Ministry of Education by TNS and Monarch Consulting.

<sup>8</sup> EdCounts website, (2007). Early Leaving Exemptions.

full-time employment than females, with NZ European males more likely to go into full-time employment and less likely to go on a training course than Māori, Pasifika or Asian males.

**Figure 6. The destination of students granted early leaving exemptions by gender and ethnic group in 2005**



## Chapter 4- Participation in Reading Recovery

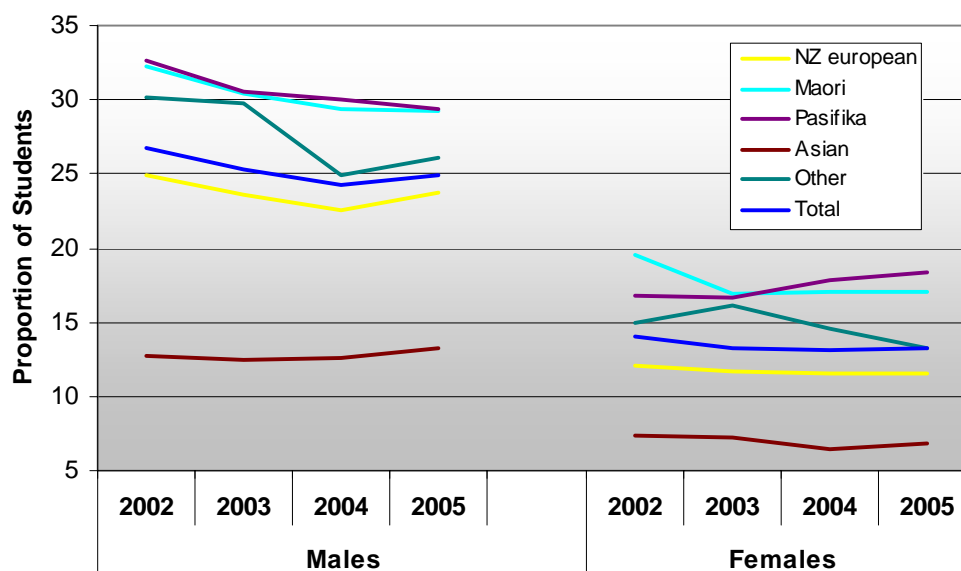
Reading Recovery is a programme designed to help the bottom 20 % of students, after a year of classroom instruction, with difficulty learning to read and write. This chapter aims to create a picture of gender differences in the Reading Recovery programme by looking at data collected during the annual monitoring of Reading Recovery.<sup>9,10</sup>

### Key Findings

- Six year old boys are twice as likely as girls to be entered into the Reading Recovery programme.
- Māori and Pasifika boys are most likely to participate.
- Reading recovery outcomes are relatively similar for girls and boys.

Data collected between 2002 and 2005 shows that 66 % of the students in Reading Recovery are boys and only 33 % are girls. Figure 7 shows the gender and ethnicity of students in Reading Recovery between 2002 and 2005. Of the 2005 cohort, 25 % of six year old boys and 13 % of six year old girls participated in Reading Recovery. Māori and Pasifika boys are most likely to participate in Reading Recovery, although there is evidence of a decline since 2002.

**Figure 7. Ethnicity and gender of students in Reading Recovery between 2002 and 2005**



<sup>9</sup> L. Ng, Research Division, Ministry of Education, (2004 and 2005). Annual Monitoring of Reading Recovery.

<sup>10</sup> V. Anand; N. Bennie, Research Division, Ministry of Education, (2002 and 2003). Annual Monitoring of Reading Recovery.



Table 2 shows the student outcomes from Reading Recovery for 2005 by gender. These values are similar to previous years. Marginally more girls than boys successfully complete Reading Recovery. Slightly more boys are referred for specialist help or long-term reading support. In 2005, around 240 girls and 700 boys were referred for specialist help or long-term reading support. Difficulty learning to read and write at a young age and unresponsiveness to Reading Recovery may have a significant impact on a child's educational progress, and hence latter success.

**Table 2. Students Reading Recovery outcomes by gender in 2005**

<b>Type of outcome</b>	<b>% Males</b>	<b>% Females</b>
Child successfully completed	58.7	62.0
Child responding and carrying over into the next year	24.6	24.0
Child referred for specialist help or long term reading support	9.5	6.5
Child responding but not able to continue	1.7	1.9
Child left school before completion	5.5	5.5
<b>Total success rate<sup>a</sup></b>	<b>83.3</b>	<b>86.0</b>

a = total success rate comprises the % of students who successfully completed Reading Recovery in 2005 plus the students who are responding and carried over to 2006 with every expectation of a successful outcome.

## Chapter 5- Achievement

This chapter reviews evidence from national and international studies and NCEA results, focusing on the core subjects of English, mathematics and science, examining achievement patterns across the schooling years in New Zealand and comparative data from countries in the OECD (Organisation for Economic Co-Operation and Development) and their partners.

### Key Findings

- Girls perform better than boys in all literacy measures across all years of schooling. However, gender differences in reading tend to decrease during secondary schooling whereas gender differences in writing increase through schooling.
- Literacy differences are also observed in qualification attainment where girls are more likely than boys to gain the literacy requirements for NCEA level 1 and to gain English as a subject at all NCEA levels<sup>11</sup> and scholarship.
- Gender differences in mathematics and science are narrower than those observed in English measures.
- National and international assessment studies show that there are no significant mathematics gender differences in primary schooling. During the early years of secondary schooling differences are still small but girls slightly outperform boys, however, this slight advantage is reversed to boys during the last years of compulsory schooling.
- There are gender differences in mathematics qualification attainment where girls are slightly more likely than boys to gain the numeracy requirements for NCEA level 1 and since the introduction of the NCEA girls are slightly more likely to gain mathematics as a subject at all NCEA levels. Even though the gender gap increases with increasing NCEA level, males are more likely to gain a mathematics scholarship.
- Gender differences in science are very small. In general boys slightly outperform girls across all years of schooling but girls are slightly more likely to gain science as a subject at all NCEA levels. The gender gap increases with increasing NCEA level but males are more likely to gain a science scholarship.
- In literacy, mathematics and science New Zealand has considerable variation in student performance but students from both genders and each ethnic group are found in the highest and lowest achieving group.

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<sup>11</sup> Candidates who achieve a subject are defined as gaining at least 14 credits in that subject within the year, at a typical level or higher.

- Boys tend to have a wider spread of scores than girls and tend to be over-represented in the lowest achieving group. This is especially true for Māori and Pasifika boys but the proportions of Māori and Pasifika girls are also a concern. Gender differences are smaller in the high achieving group with boys tending to be under-represented in this group in literacy but over-represented in mathematics and science.
- Higher proportions of male candidates, across all ethnic groupings, receive 'not achieved' grades in English, mathematics and science NCEA externally assessed achievement standards.
- There is evidence that students who have more positive attitudes or higher self-concept towards English measures, mathematics and science tend to score higher than those with negative attitudes or lower self-concept.

### **5.1. English (Literacy, Reading and Writing)**

Analysis of results on English measures shows that girls perform better than boys and these differences are evident early on in schooling and persist through all stages of education.

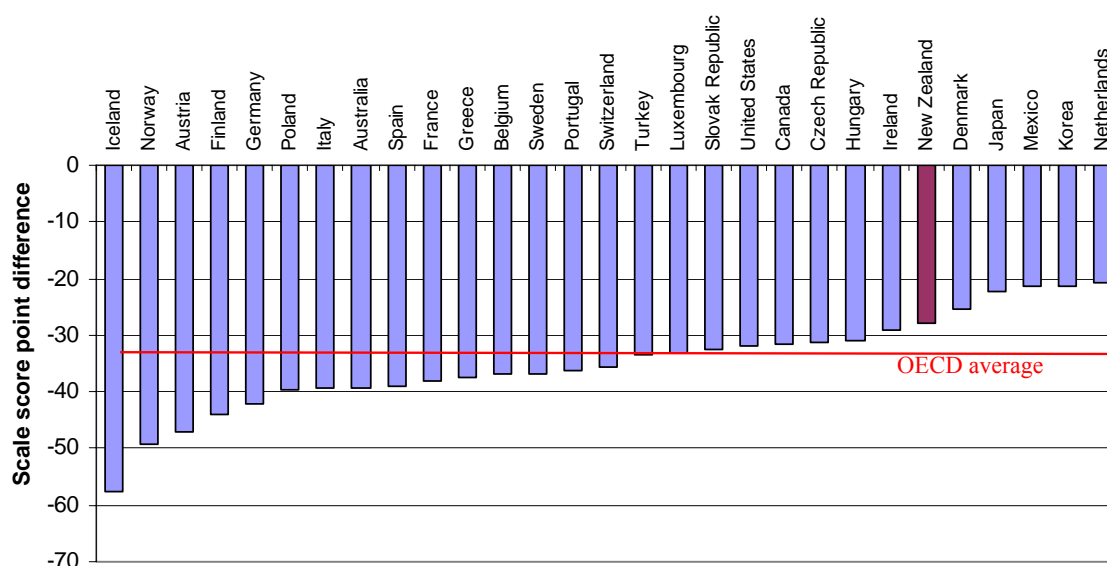
- The Competent Children, Competent Learners study<sup>12</sup> found that girls outperformed boys on early literacy measures at age five, but these differences were not significant. However, by age six girls were performing much better than boys on all literacy measures.
- Reading and writing assessment results from the National Education Monitoring Project (NEMP) for year 4 students shows that there are significant differences between boys and girls in reading and writing, with girls outperforming boys.
- Gender differences in literacy measures were still evident at age eight from the Competent Learners study.
- Results from the Progress in International Reading Literacy Study (PIRLS) for year 5 students showed that girls performed significantly higher than boys. This gender difference was observed between all ethnic groupings, but Pasifika and Asian students had the largest gender gap. New Zealand had one of the largest gender differences favouring girls observed internationally. PIRLS assessed two aspects of literacy, reading for literacy purposes and reading for informational purposes. Both girls and boys performed higher in reading for literacy purposes, but the gender difference was smaller in reading for informational purposes.
- Reading results from Assessment Tools for Teaching and Learning (asTTle) show that both boys and girls increase their mean reading scores from year 5 to year 8, however, girls scored consistently higher than boys. Over this time period there is evidence that the gender gap decreases. Gender gaps are evident across all ethnic groupings, and these gaps all decrease from year 5 to year 8. Pasifika students have the largest gender gap in year 5 but the smallest in year 8 and thus see the largest decrease in the gender gap over primary schooling.

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<sup>12</sup> The Competent Learners reports can be downloaded from the NZCER website: [www.NZCER.org.nz](http://www.NZCER.org.nz)

- Writing results from asTTle show that both boys and girls increase their mean writing scores from year 5 to year 8, however, girls scored consistently higher than boys. The gender gap in writing is found to increase from year 5 to year 8, this is true of all ethnic groupings.
- NEMP results for year 8 student's show that girls in general perform better than boys in reading, but this difference has decreased over time. In writing girls also perform better than boys but the gender gap has increased over time.
- Data collected from the Competent Learners study shows that literacy and writing gender differences are evident through the remaining years of compulsory schooling.
- asTTle reading results show that there is a rapid increase in average achievement from the first year of secondary schooling (year 9 onwards). At all years girls are still performing better than boys, but the difference between girls and boys average achievement decreases. This is evident across all ethnic groupings.
- During secondary schooling (year 9 onwards) asTTle writing results show girls still outperforming boys. The gender gaps are largest in years 9 and 10 and decrease again in years 11 and 12.
- The average performance of New Zealand 15 year olds in reading is significantly higher than the OECD average. Girls performed significantly higher than boys in reading literacy in the Programme for International Student Assessment (PISA) at age 15, across all ethnic groupings. There is also some evidence of a reduction in the gender gap from 2000-2003. Compared to other countries in the OECD New Zealand has a relatively modest gender gap (see Figure 8).

**Figure 8. Gender difference (boys-girls) in PISA reading scores, 2003**



- To gain an NCEA level 1 qualification, students must gain eight specified literacy credits. The proportion of year 11 students gaining the literacy requirements has increased from 2004 to 2006, but higher proportions of girls gain these requirements. However, there is evidence of a reduction in the gender gap over this time.
- Female candidates<sup>13</sup> are historically more likely to attain<sup>14</sup> English (school certificate and NCEA level 1) than male candidates (see section 6.4.1). In 2006, female NCEA candidates were 25 % more likely than male candidates to attain English in year 11; however this had reduced from 30 % more likely in 2004. English attainment rates decrease from year 11 to year 13, but since 2004 the attainment rates in year 12 and 13 have increased.
- In 2006, 383 scholarships were gained in English (see section 6.3). Of these scholarships, 68 % were awarded to females and 32 % to males. However, this is similar to the proportions of males (35 %) and females (65 %) who studied English in year 13 for 14 credits or more and can attempt to gain a scholarship.

Overall, girls perform better than boys on English measures. There is evidence of a narrowing of the gender gap in reading with increased years of schooling, but the gender gap widens in writing. These gender gaps exist across all ethnic groupings, but gender gaps do vary across ethnic groups. These literacy differences observed across schooling are also evident in qualification attainment where girls are more likely than boys to gain the NCEA literacy requirements and to gain English as a subject at each NCEA level.

### **5.1.1 Attainment at the Extremes**

In New Zealand all schools and social groups have some good readers and writers but certain characteristics give a student a far higher chance of being a poor reader or writer than others. A number of the studies mentioned in section 5.1 also collect information on the composition of students who make up the high achieving and low achieving groups.

#### **Low Achieving Group**

- The Competent Learners study found that boys are more likely than girls to be in the lowest performing group in reading and writing at age five and eight. However, there was evidence of a slight reduction in the over-representation of boys in the low achieving group from age five to age eight.
- PIRLS found that 16 % of New Zealand year 5 students scored below the lowest quarter benchmark (below this students will have difficulty with the most basic reading task, for both literacy and informational purposes). This group was comprised of 64 % boys and 36 % girls, which equates to 20 % of year 5 boys and 11 % of year 5 girls. Māori boys (39 %) and Pasifika boys (37 %) were notably over-represented compared with the proportions they represent in the population but the proportion of Māori girls (25 %) is also a concern.

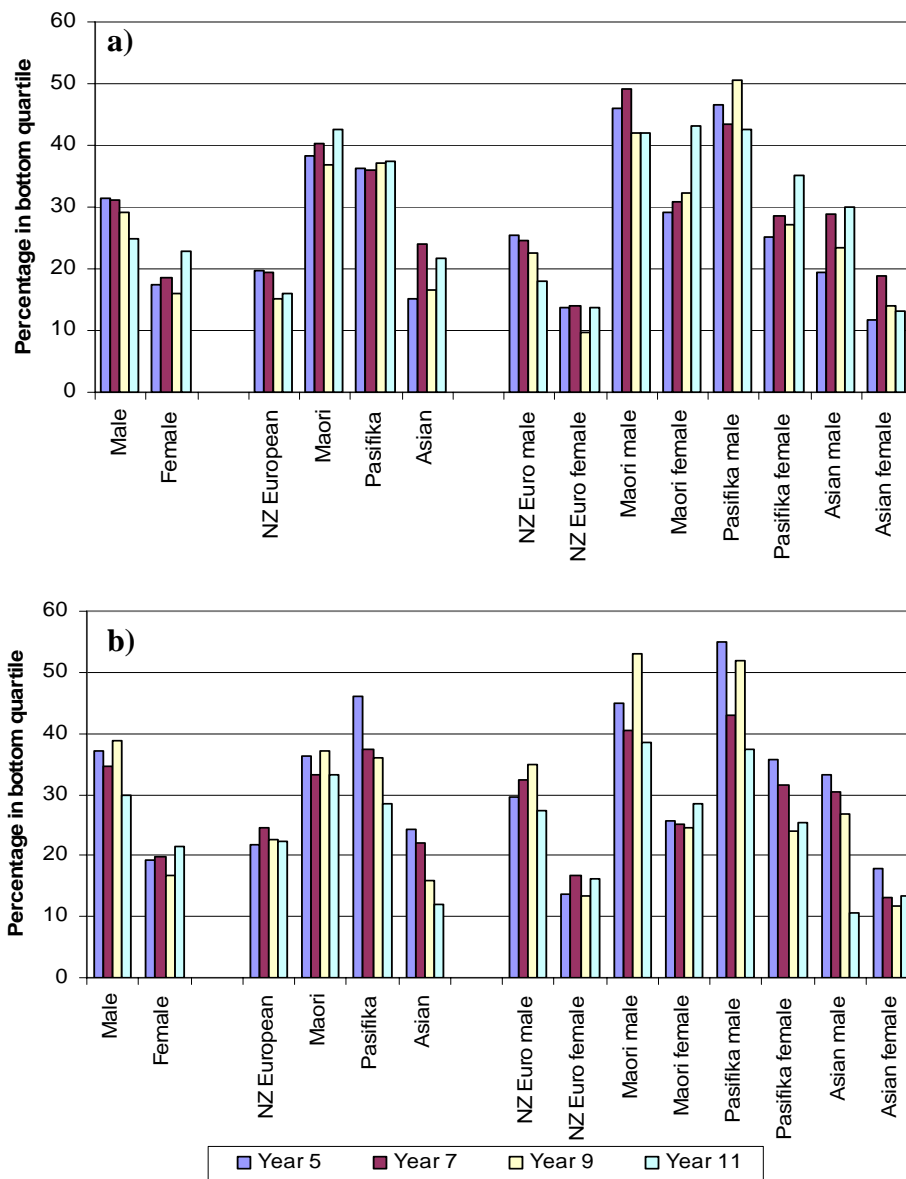
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<sup>13</sup> A candidate is a student gaining at least one credit at the relevant year level.

<sup>14</sup> Attainment in a subject is classified as gaining at least 14 credits in that subject at a typical level or higher for NCEA or receiving an A, B or C grade in School Certificate.

- The composition of the lower quartile group from asTTle results shows that boys are significantly more likely to be in this group than girls, from year 5 to year 9, for both reading and writing (see Figure 9). From year 10 onwards even though higher proportions of boys were in the lower performing group the differences were not significant. Significantly higher proportions of Māori and Pasifika boys are in this group for reading but significantly higher proportions of Māori females are also found in this group. For writing higher proportions of Māori and Pasifika boys are in the lowest quartile, but also high proportions of Pasifika females are within this group. The gender differences are larger in writing than in reading.

**Figure 9. The characteristics of students in the lowest asTTle quartile for a) reading and b) writing**



- PISA found that 14 % of New Zealand 15-year olds perform at or below proficiency level 1. In 2003 this group comprised of 62 % boys and 38 % girls. Māori boys (32 %) and Pasifika boys (38 %) were most likely to be in this group and NZ European boys (11 %) and NZ European girls (5 %) were least likely to be in this group.
- Results from NCEA externally assessed English achievement standards show that boys are more likely than girls to not achieve (NA) the standards. This is true for all ethnic groupings, but higher proportions of Māori and Pasifika students gain NA in these standards. The overall gender difference decreases from 15 percentage points at NCEA level 1 to eight percentage points at NCEA level 3, this may reflect the fact that more candidates will be self-selecting English standards in the later years (once they have completed their literacy requirements) and are doing them because they are interested in them.

### **High Achieving Group**

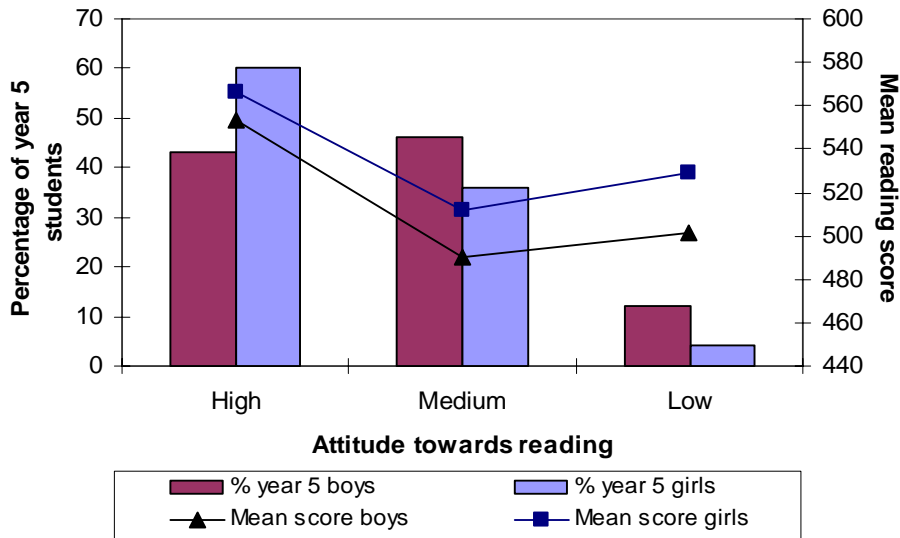
- The Competent Learners study found that boys are less likely than girls to be in the highest performing group in reading and writing at age five and eight. However, this gender gap is much smaller than that observed between boys and girls in the lowest achieving group.
- PIRLS found that 35 % of New Zealand year 5 students scored above the upper quartile benchmark and this group comprised of 44 % boys and 56 % girls. Māori and Pasifika boys are least likely to be in this group, but the proportions of Māori and Pasifika girls is a concern and lower than the proportion of boys from the other ethnic groupings.
- The composition of the upper quartile group from asTTle results shows that boys are less likely to be in this group than girls for both reading and writing. However, from year 10 onwards these differences are not significant. Gender differences are higher for writing than for reading. In reading, lower proportions of Māori and Pasifika boys are in this group but from year 6 to year 9 significantly lower proportions of Māori females are also found in this group. For writing Māori and Pasifika boys are least likely to be in the upper quartile, but none of the differences between sub-groups were found to be significant.
- PISA also found that 40 % of 15-year olds perform at or above proficiency level 4. This group is comprised of 44 % boys and 56 % girls. This gender difference is much smaller than that observed in the low achieving group. Pakeha girls (57 %) are significantly more likely to be in the high achieving group, whereas Pasifika boys (15 %) and Māori boys (18 %) are least likely. Low proportions of Pasifika girls (20 %) are also found in this group.
- Results from NCEA externally assessed achievement standards show that boys are less likely than girls to gain excellence grades in English standards. This is evident across all ethnic groupings.

### **5.1.2 Attitudes to English**

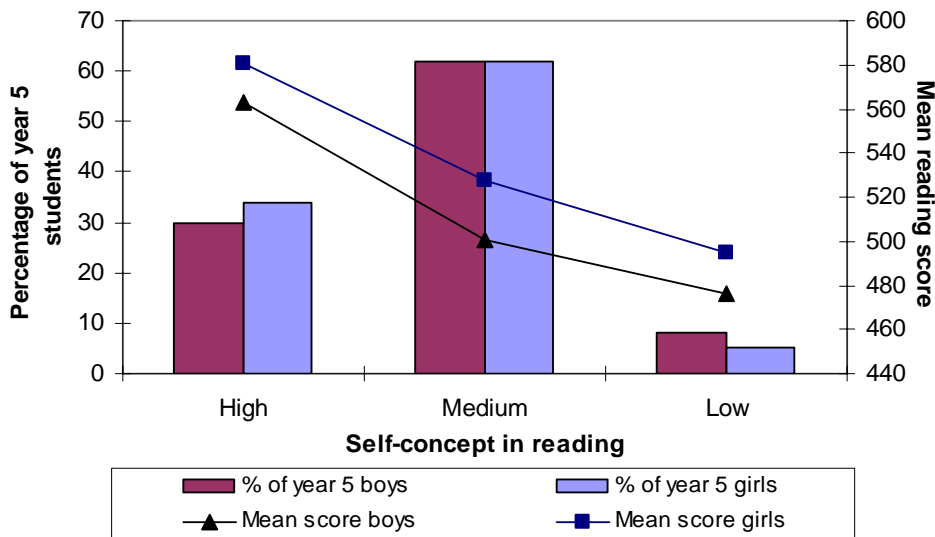
A number of the studies mentioned in section 5.1 also collect information on student's attitudes and self-concept in reading and writing. In general, girls report a greater interest in reading than boys. Examples of the relationship between student's attitudes and self-concept

(from PIRLS) in reading to the mean reading achievement are shown in Figures 10 and 11 respectively. Girls are more likely than boys to have positive attitudes towards reading and conversely, boys are more likely to hold negative attitudes towards reading. The mean achievement of girls and boys with more positive attitudes towards reading was higher than the girls and boys with less positive attitudes in all studies.

**Figure 10. Proportion and mean reading achievement for year 5 students at each attitude level for reading by gender from PIRLS 2001**



**Figure 11. Proportion and mean reading achievement for year 5 students at each level of self-concept in reading by gender from PIRLS 2001**



Studies also show that higher proportions of girls are at the high level of reading self-concept. Boys and girls at the high level of reading self-concept, achieve, on average, higher mean reading scores than those at lower levels of reading self-concept. However, at each reading self-concept level the mean achievement of girls is higher than that of boys (see Figure 11).



As students progress through school there is evidence that their liking for reading decreases, with more students having negative attitudes toward reading and less students having highly positive attitudes toward reading. This is observed for girls and boys. However, students liking for writing increases during primary schooling and then remains reasonably constant during secondary schooling.

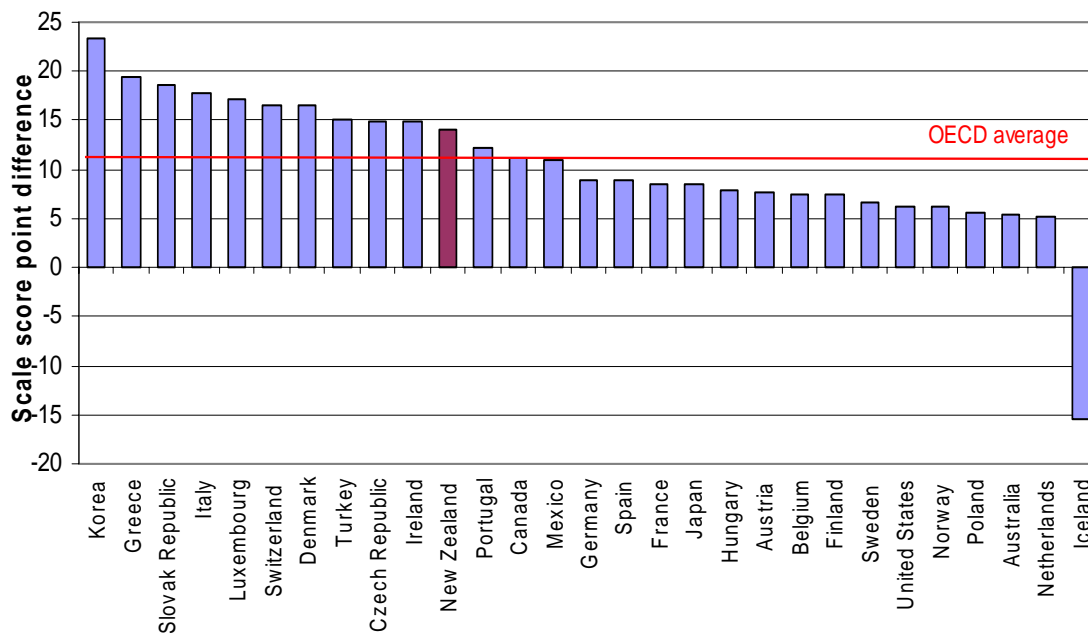
## 5.2. Mathematics

Analysis of mathematics results shows that gender differences in mathematics are narrower than English. Some studies show that the gender differences are in favour of males and some show they are in favour of females.

- The Competent Children, Competent Learners study at age five and six found no differences between girls and boys on early mathematics measures.
- Mathematics assessment results from NEMP for year 4 student's shows that there are no significant differences between boys and girls in mathematics, but boys slightly outperform girls. However, there is evidence that this slight advantage to boys has decreased between 2001 and 2005.
- Gender differences were still not evident in mathematics at age eight from the Competent Learners study.
- Results from the Trends in International Mathematics and Science Study (TIMSS) for year 5 students showed no significant differences between girls and boys. In 1994 there was a slight advantage to girls; however, this advantage had disappeared by 2002. Compared to other ethnic groupings, Māori boys perform significantly lower than Māori girls. Across the different mathematics areas assessed in TIMMS New Zealand students had a relative strength in *Geometry* and *Data* and a weakness in *Number*. The only significant gender differences were observed in *Geometry* where girls achieved higher than boys and *Measurement* and *Data* where boys performed significantly better than girls.
- Mathematics results from asTTle show no gender differences from year 5 to year 8.
- NEMP results for year 8 students show a very small advantage to girls.
- Results from TIMSS for year 9 students showed no significant differences between girls and boys. Only Asian students have shown significant gains in mean scores between 1994 and 2002, with Asian students outperforming students from all other ethnic groups. New Zealand year 9 students achieved significantly above the international mean in all mathematics content areas, but relative to their overall mathematics performance year 9 students were weakest in *Number*, while *Data* was an area of relative strength. There were no significant gender differences detected across the different content areas.
- Data collected from the Competent Learners study shows that a small gender difference in favour of girls was evident at age 14, however, by age 16 this advantage was in favour of boys.

- asTTle mathematics results shows that a gender difference in favour of girls becomes evident from year 8 onwards. This gender difference in favour of girls is much smaller than that observed in English measures. Gender gaps are evident across all ethnic groupings, but due to the small sample sizes it is not possible to calculate whether any of these differences are significant. In general, the differences between Māori girls and boys are largest across all ethnic groupings.
- The average performance of New Zealand 15-year olds in mathematics is significantly higher than the OECD average. The 2003 PISA results found a small but statistically significant advantage to boys in mathematics at age 15. This slight advantage to boys was evident across all ethnic groupings and mathematical content areas. The gender gap in mathematics is smaller than that observed in reading but compared to other countries in the OECD New Zealand has a slightly larger gender gap (see Figure 12). The variance in the distribution of scores was larger for New Zealand boys than girls, but the scores achieved at both the lower and upper percentiles of the distribution were higher than that for girls.

**Figure 12. Gender difference (boys-girls) in PISA mathematics scores, 2003**



- To gain an NCEA level 1 qualification, students must gain eight specified numeracy credits. The proportion of year 11 students gaining the numeracy requirements has increased from 2004 to 2006, but higher proportions of girls (two percentage points) gain these requirements.
- Male School Certificate candidates were slightly more likely (between 1-5 % from 1993 to 2001) to attain mathematics than female candidates (see section 6.4.2). Since the introduction of NCEA this has reversed and female candidates are slightly more likely (approximately 3 %) than males to attain mathematics in year 11. Females are also more likely to attain NCEA mathematics in year 12 and 13. Between 2004 and 2006 the

attainment rates have increased in years 11 to 13 for both males and females. However, as the NCEA year level increases the percentage point gender gap in favour of females increases.

- In 2006, 671 scholarships were gained in mathematics (see section 6.3). Of these scholarships, 72 % were awarded to males and 28 % to females. Compared to the proportion of males in year 13 who have studied mathematics for 14 credits or more (48 %), males are more likely to gain mathematics scholarships than females.

Gender differences in mathematics are narrower than those observed in English measures. Unlike literacy, gender differences in mathematics vary through schooling. No significant mathematics gender differences are observed in primary schooling, but during the early years of secondary schooling, even though differences are small, girls slightly outperform boys. This slight advantage is reversed to boys during the last years of compulsory schooling. Gender differences are also evident in qualification attainment. Girls are more likely than boys to gain the NCEA numeracy requirements for NCEA level 1 and attain 14 credits or more in mathematics in year 11. This gender difference increases with increasing NCEA year level but year 13 males are more likely to gain a mathematics scholarship than their female counterparts.

### **5.2.1 Attainment at the Extremes**

Even though New Zealand students perform well in mathematics internationally, New Zealand also has considerable variation in student performance. This suggests that educational programmes, schools and teachers may not be appropriately addressing the wide range of student knowledge and skills that exist within the education system. A number of the studies mentioned in section 5.2 also collect information on the composition of students who make up the high achieving and low achieving groups. These may give some indication of the student characteristics within these two groups.

#### **Low Achieving Group**

- The Competent Learners study found that boys are more likely than girls to be in the lowest performing group in mathematics at age five and eight. However, there was evidence of a reduction in the over-representation of boys in the low achieving group from age five to age eight.
- TIMSS found that 14 % of New Zealand year 5 students scored below the lowest benchmark (below this students will have difficulty with the most basic mathematics tasks). This has reduced from 22 % of students in 1994. In 1994, 12 percentage points more boys than girls were performing below the TIMSS low mathematics benchmark. However, in TIMSS 2002 the proportion of girls and boys performing below the lowest mathematical benchmark is approximately equal.<sup>15</sup>
- TIMSS found lower percentages of year 9 students performing below the low mathematics benchmark. In 2002, 12 % of New Zealand year 9 students performed at this level, and there have been no significant changes between 1994 and 2002. In all TIMSS

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<sup>15</sup> Due to the small number of students it is not possible to break down gender information into the different ethnic groupings.

cycles higher proportions of boys were in the lowest performing group and this has increased from six percentage points more boys than girls in 1994 to 10 percentage points more boys than girls in 2002.

- The composition of the lower quartile group from asTTle results shows that slightly more boys than girls are in this group across all years, but these differences are not significant. However, Māori and Pasifika students are statistically more likely to be in this group than their NZ European and Asian/Other counterparts. Within ethnic groupings there are some differences by gender. Across all years similar proportions of NZ European and Asian/Other boys and girls are in this group but Māori and Pasifika boys are more likely to be in this group than Māori and Pasifika girls. Across all years of schooling Pasifika boys are most likely to be in the lowest asTTle mathematics quartile.
- PISA found that 15 % of New Zealand 15-year olds perform at or below proficiency level 1. The proportion of boys and girls in this group was similar, with a slightly higher proportion of girls (52 % compared to 48 %) and within each ethnic grouping there was little variation between the proportion of girls and boys. Although the gender differences within ethnic groupings were similar, Māori and Pasifika boys and girls are over-represented in this lowest performing group.
- Results from NCEA externally assessed mathematics achievement standards show that boys are slightly more likely than girls to not achieve the standards. This is evident across all ethnic groupings, but higher proportions of Māori and Pasifika students gain NA in these standards.

### **High Achieving Group**

- The Competent Learners study found that slightly higher proportions of boys (52 % of boys and 48 % of girls) performed in the highest mathematics quartile at age five, and by age eight, the over-representation of boys had grown (59 % of boys and 41 % of girls).
- TIMSS found that 26 % of New Zealand year 5 students scored at or above the high mathematics benchmark, this is significantly lower than the international mean of 33 %. The gender difference in this group is very small, however, Māori and Pasifika students are under-represented but this is true of girls and boys.
- TIMSS found that 24 % of New Zealand year 9 students scored at or above the high mathematics benchmark, this is similar to the international mean. The gender difference in the group is small but girls were slightly less likely to be represented in this high achieving group. This pattern is evident across all ethnic groupings. However, Māori and Pasifika students remain under-represented in this group and compared to year 5 their under-representation has grown.
- The composition of the upper quartile group from asTTle results shows that boys are slightly more likely to be in this group up to year 7, but from year 8 onwards girls are more likely to be in this group. These gender differences are also observed within each ethnic grouping, but Māori and Pasifika students are statistically less likely to be in this group than their NZ European and Asian/Other counterparts. Across all years the proportion of boys in the upper mathematics quartile remains relatively constant at around

28 %, however, in general the proportion of girls in this quartile increases with increasing school year.

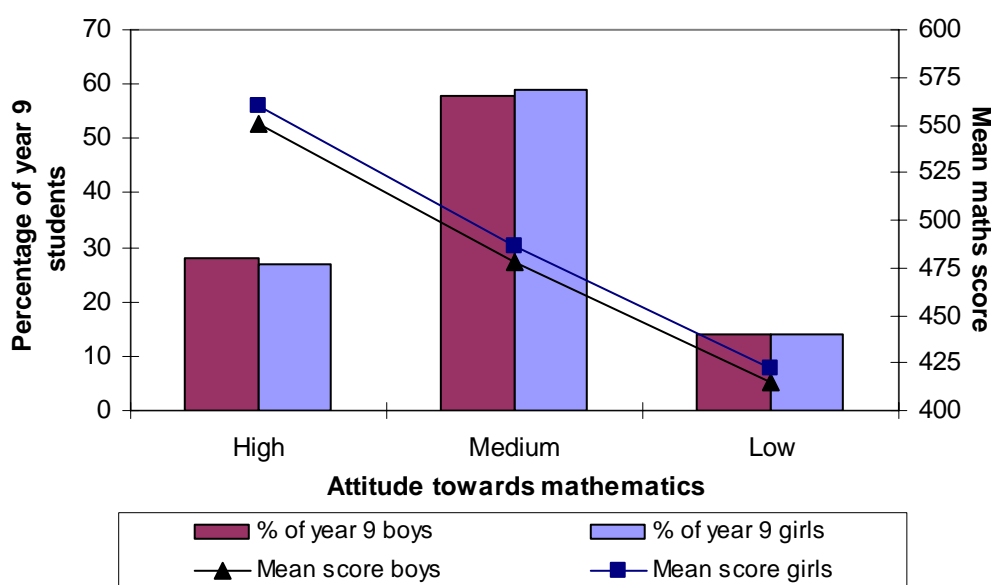
- PISA also found that 21 % of 15-year olds perform at or above proficiency level 5, compared to an international mean of 15 %. This New Zealand group is comprised of 58 % boys and 42 % girls. This gender difference in favour of boys is also evident within each ethnic grouping. Pasifika girls are least likely to be in this group, but Pasifika boys, Māori boys and Māori girls are also under-represented in this group.
- Results from NCEA externally assessed achievement standards show that boys are just as likely as girls to receive excellence grades in mathematics standards at all NCEA levels. This is evident across all ethnic groupings, but Māori and Pasifika students are less likely to receive excellence grades than their NZ European and Asian counterparts.

### 5.2.2 Attitudes to Mathematics

A number of the studies mentioned in section 5.2 also collect information on student's attitudes and self-concept in mathematics. In general, across all studies, slightly higher proportions of boys than girls liked and were confident in mathematics. This was evident across all years of schooling. However, students liking and confidence in mathematics tended to decrease with increasing school year, for both boys and girls.

Once again there was evidence that boys and girls with positive attitudes towards mathematics achieve, on average, higher mean mathematics scores than those with less positive attitudes. An example for year 9 students in TIMSS is shown in Figure 13.

**Figure 13. Proportion and mean mathematics achievement for year 9 students at each attitude level for mathematics by gender from TIMSS 1998**



### 5.3. Science

Analysis of science results shows that gender differences in science have traditionally been very small.

- Science assessment results from NEMP for year 4 student's shows that there are no significant differences between boys and girls in science, but boys slightly outperform girls.
- Results from TIMSS for year 5 students show that year 5 students achieved, on average, significantly above the international mean for science. Between 1994 and 2002 the New Zealand mean science score has increased significantly, this was observed for girls and boys. In 2002, there was a small difference in mean scores in favour of girls, across all ethnic groupings, but this was not significant. However, significant gender differences in favour of girls were evident in *Life* and *Physical* sciences, but there was no difference in *Earth* science. Māori and Pasifika students perform significantly below their NZ European and Asian peers. However, between 1994 and 2002, Māori and Pasifika students, especially boys, made the most significant gains in achievement, reducing the gap from approximately 100 to 30 scale score points.
- NEMP results for year 8 students show no significant gender difference. However, there is a slight advantage to boys and this is at a similar level to those observed in year 4.
- Results from TIMSS for year 9 students show that year 9 students achieved, on average, significantly above the international mean for science. Between 1994 and 2002 there has been no significant change in the overall New Zealand mean science score. In 1994 boys achieved on average significantly higher than girls, but girls have closed the gap on boys over the last two TIMSS cycles (across all ethnic groupings) and now there are no significant gender differences. Even though Māori and Pasifika students have made gains in achievement since 1994, they still perform significantly lower than their NZ European and Asian counterparts.
- The average performance of New Zealand 15-year olds in science is significantly higher than the OECD average. However, compared to other countries New Zealand has a relatively large distribution of scores, and the distribution for boys is wider than that for girls. There was no significant difference in the mean science score from PISA 2000 to PISA 2003, however, in 2000 the overall performance of girls was higher than boys but in 2003 the advantage had moved to boys. This shift in advantage to boys was due to a decrease in the performance of girls rather than an increase in the performance of boys. In 2003, the slight advantage to boys was observed across all ethnic groupings, but Māori and Pasifika students scored significantly lower than their NZ European and Asian peers.
- Female candidates are slightly more likely to attain science (school certificate and NCEA level 1) than male candidates (see section 6.4.3). Around 60 % of year 11 candidates attain science this is the lowest rate across the three main subject areas (English, mathematics and science). Science attainment rates stay at approximately 60 % for male candidates in years 12 and 13 but they increase by around four percentage points for female candidates. This results in an increased gender gap in favour of females in NCEA years 12 and 13. By individual science subject (biology, chemistry and physics) it is found that in years 12 and 13 physics has the highest attainment rate followed by biology then chemistry. This is true for both males and females; with females having slightly higher attainment rates in physics and biology but there is no difference for chemistry.
- In 2006, 623 scholarships were gained in science (see section 6.3). Of these scholarships, 64 % were awarded to males and 36 % to females. The number awarded to males is

higher than the proportion of males in year 13 who have studied science for 14 credits or more (47 %). The gender gap is found to vary across the three areas of science. In biology males made up 40 % of scholarships compared to 33 % of the year 13 cohort who have studied for 14 credits or more. In chemistry 70 % of males gained a scholarship but they made up only 46 % of the year 13 cohort who had studied chemistry for 14 credits or more. Also, the majority (89 %) of physics scholarship were gained by males but this is much larger than their representation in the year 13 cohort who had studied physics for 14 credits or more (63 %).

Overall, gender differences in science are negligible. Even though gender differences are small there are large variations in the performance of students in science with Māori and Pasifika students performing, on average, significantly lower than their NZ European and Asian counterparts. In general, boys slightly outperform girls across all years of schooling but girls are more likely to attain 14 credits or more in science in year 11. This gender difference increases with increasing NCEA year level but year 13 males are more likely to gain a science scholarship than their female counterparts.

### **5.3.1 Attainment at the Extremes**

New Zealand is found to have a relatively large distribution of science scores and information collected from TIMSS shows the composition of students who make up the high achieving and low achieving groups.

#### **Low Achieving Group**

- TIMSS found that 8 % of New Zealand year 5 students scored below the lowest benchmark (below this students will have difficulty with the most basic science tasks). This has reduced from 15 % of students in 1994. In 1994, this group was made up of 61 % boys and 39 % girls, a 22 percentage point gender difference. In TIMSS 2002 this gap had reduced to 8 percentage points (54 % boys and 46 % girls).
- TIMSS found lower percentages of year 9 students performing below the low science benchmark. In 2002, 6 % of New Zealand year 9 students performed at this level, this has reduced from 11 % in 1994. Girls are slightly over-represented in this group. In 2002, this group was made up of 44 % boys and 56 % girls a 10 percentage point gender difference. This is similar to the difference in 1994.
- Results from NCEA externally assessed achievement standards show that boys are more likely than girls to not achieve science standards at NCEA level 1 and 2, but this is reversed at level 3. Across all ethnic groupings, Māori and Pasifika students are more likely to not achieve science standards than their NZ European and Asian counterparts.

#### **High Achieving Group**

- TIMSS found that 38 % of New Zealand year 5 students scored at or above the high science benchmark, this is significantly higher than the international mean of 30 %. In 2002, similar proportions of boys and girls were in this group (48 % boys and 52 % girls). Māori boys (30 %) and Pasifika boys (27 %) and girls (25 %) had a smaller proportion of students in this benchmark than would be expected.

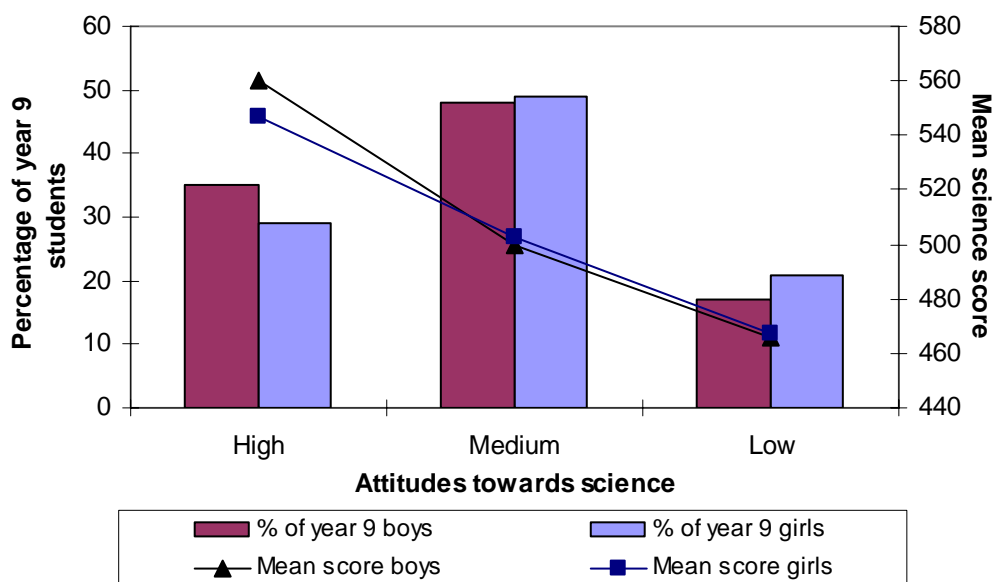
- TIMSS found that 35 % of New Zealand year 9 students scored at or above the high science benchmark, this is significantly high than the international mean of 25 %. In 2002, slightly higher proportions of boys than girls reached the high benchmark (52 % boys and 48 % girls). Māori girls and boys (15 % and 22 % respectively) and Pasifika girls and boys (8 % each) had a smaller proportion of students in this benchmark than would be expected. The under-representation of these groups had increased from the year 5 level.
- Results from NCEA externally assessed achievement standards show that boys are slightly less likely than girls to receive excellence grades in science standards at all NCEA levels. This is evident across all ethnic groupings, but Māori and Pasifika students are less likely to receive excellence grades than their NZ European and Asian counterparts.

### 5.3.2 Attitudes to Science

A number of the studies mentioned in section 5.3 also collect information on student's attitudes and self-concept in science. In general, across all studies, slightly higher proportions of boys than girls liked and were confident in science. This was evident across all years of schooling. However, students liking and confidence in science tended to decrease with increasing school year, for both boys and girls.

Once again there was evidence that boys and girls with positive attitudes towards science achieve, on average, higher mean science scores than those with less positive attitudes. An example for year 9 students in TIMSS is shown in Figure 14.

**Figure 14. Proportion and mean science achievement for year 9 students at each attitude level for science by gender from TIMSS 1998**





## Chapter 6- Attainment of NCEA Qualifications

This chapter explores gender differences in NCEA qualification attainment. It also looks at subject participation and attainment<sup>16</sup> data dating back to 1993.

### Key Findings

- The percentage of students, both male and female, gaining NCEA qualifications has increased from 2004 to 2006.
- In years 11 and 12 females are 10 percentage points more likely to gain an NCEA level 1 and 2 qualification respectively. This gender difference increases to 13 percentage points in year 13 for NCEA level 3.
- Female students are more likely than males to gain University Entrance. The proportion of Māori and Pasifika students, especially males, gaining University Entrance is particularly concerning.
- Scholarship attainment is similar for males and females. Males gain 58 % of their total scholarships in science and mathematics.
- Gender differences in the participation rates of students in English, mathematics and science are greater in year 12 and 13 than year 11 qualifications.
- Since 1993 the range of attainment gender differences for mathematics (from 3 percentage points in favour of males to 3 percentage points in females favour) and science (3 percentage points in favour of females) are much smaller than that found for English (where it is in the range 14 to 19 percentage points in favour of females).

### 6.1 NCEA Qualifications

The rate of NCEA qualification attainment by male and female students is calculated based on the number of NCEA qualifications gained and the numbers of students reported on the July school roll returns.<sup>17</sup> Figures 15 to 17 show the proportions of male and female students achieving NCEA qualifications in 2006 by year of schooling and gender for NCEA levels 1 to 3 respectively.

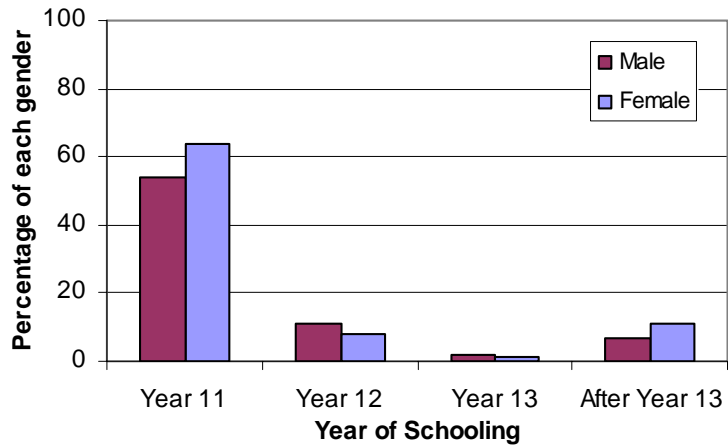
Year 11 is the typical year for students to gain NCEA level 1, year 12 for NCEA level 2 and year 13 for NCEA level 3 qualifications. The percentage of students, both male and female, gaining NCEA qualifications has increased from 2004 to 2006. However, there is a 10 percentage point difference between males and females gaining NCEA level 1 in year 11, and NCEA level 2 in year 12. At NCEA level 3 this gender difference increases to 13 percentage points in favour of females. These gender differences have been evident each year since the introduction of NCEA.

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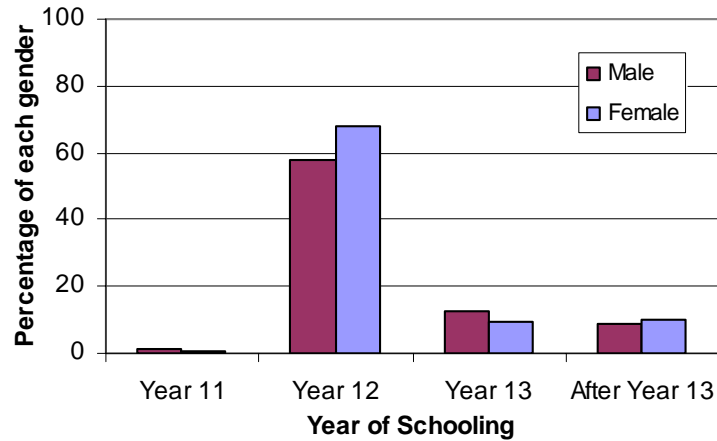
<sup>16</sup> Attainment in a School Certificate subject refers to results at grades A, B and C. Attainment in a subject at NCEA refers to gaining at least 14 credits in that subject at a typical level or higher.

<sup>17</sup> Ministry of Education data.

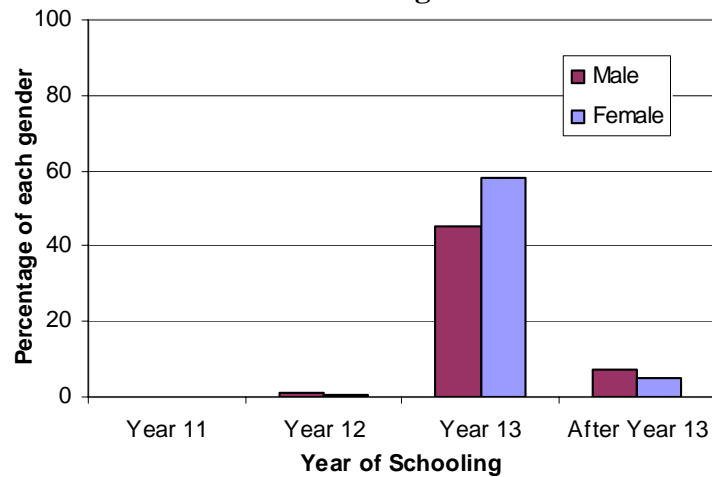
**Figure 15. Percentage of students achieving NCEA level 1 in 2006 by gender and year of schooling**



**Figure 16. Percentage of students achieving NCEA level 2 in 2006 by gender and year of schooling**



**Figure 17. Percentage of students achieving NCEA level 3 in 2006 by gender and year of schooling**



Even though slightly higher proportions of male students than female students gain NCEA qualifications in the non-typical years for gaining these qualifications they are not in great enough proportions to result in gender parity for this qualification. Thus, higher numbers of female students than male students gain NCEA qualifications and higher numbers of male students than female students leave school with no formal qualification.

Differences in qualification attainment are also observed between ethnic groups, with Māori and Pasifika students having lower attainment rates than their Asian and NZ European counterparts. Within each ethnic grouping gender differences are still observed.

## 6.2 University Entrance

A University Entrance qualification enables students to go directly into further tertiary study at degree level. Year 13 is the typical year for students to gain University Entrance and Table 3 shows the percentages of the male and female students on the year 13 school rolls gaining University Entrance from 2004 to 2006. From 2004 to 2006 there has been an increase in the percentage of males and females gaining University Entrance, but across all years around a 10 to 11 percentage point gender gap has existed in favour of female students.<sup>18</sup> The percentage of Māori and Pasifika students gaining University Entrance is very low and particularly concerning.<sup>19</sup>

**Table 3. The percentage of year 13 students gaining university entrance in 2004, 2005 and 2006 by gender**

Year	Year 13 school roll		
	Male	Female	Difference
2004	40.1	50.6	10.5
2005	41.7	51.4	9.7
2006	43.4	54.3	10.9

## 6.3 Scholarship

Scholarship is an external examination for top secondary students. Candidates usually enter in year 13 and scholarship examines course material related to level 3 standards in a limited number of subjects. The intention is that three per cent of the cohort will be awarded scholarship in each subject that is three per cent of the number of students studying that subject in year 13 at level 3 for 14 or more credits – as long as they meet the standard.

In 2006, 1,502 males and 1,426 females gained scholarships at either scholarship or outstanding level, compared to 1,395 males and 1,367 females in 2005. Scholarship assesses the elite students at NCEA level 3 and at this top level no gender disparity exists. The reduction in gender disparity at scholarship level is likely to reflect students' self-selection and interest in the standards and learning areas they are studying.

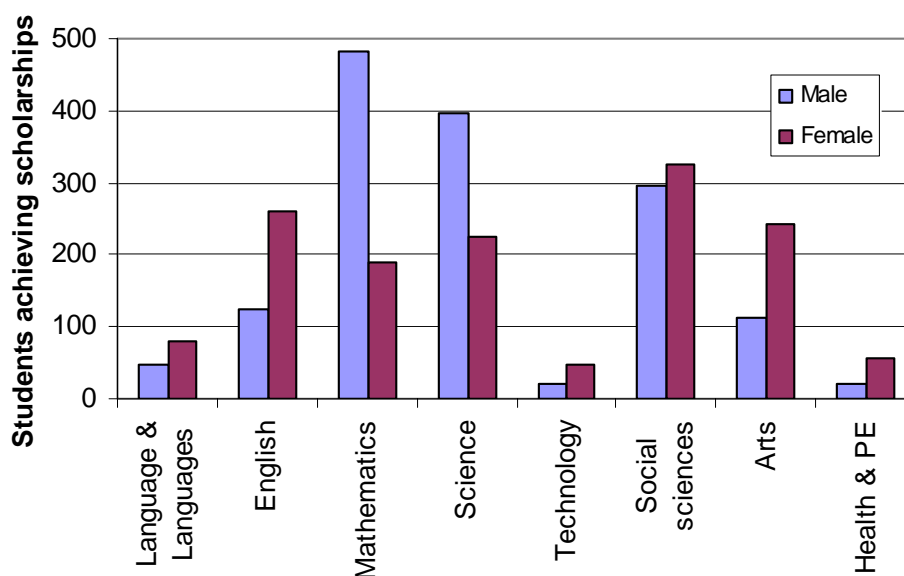
The number of students achieving scholarships (at scholarship and outstanding level) across the different learning areas is shown in Figure 18 for the 2006 results. A higher number of females than males gain scholarships across all subject areas except mathematics and science.

<sup>18</sup> The percentage point gender difference is also about 11 percentage points when compared to that cohorts' year 9 school roll.

<sup>19</sup> C. Harkess; H. Wong; M. Parkin. (2007). Senior Secondary Student Achievement Factsheet 2004-2006.

In mathematics and science the number of males receiving scholarship is significantly higher than the number of females receiving scholarships. For males, 58 % of the total number of scholarships obtained is in mathematics and science, for females there is a more equal spread across all learning areas.

**Figure 18. Total number of students achieving scholarships by learning area and gender in 2006**



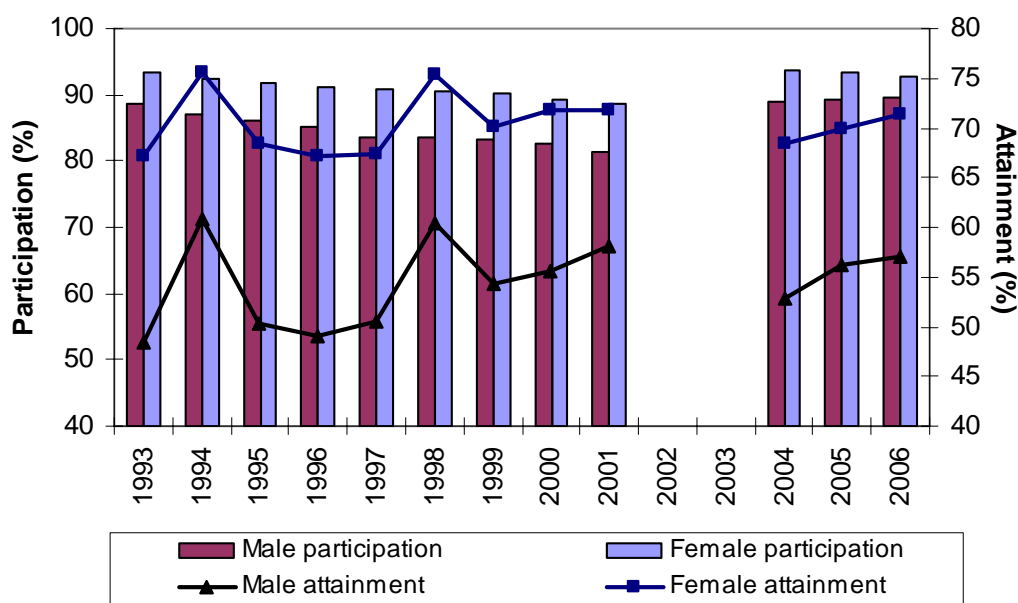
#### 6.4. Subject Participation and Attainment

The New Zealand school qualification system has changed over the years, but English, mathematics and science tend to be classed as the three core subject areas and will be the focus of this section. The participation and attainment in these three subject areas in NCEA and historically in School Certificate examinations show some enduring and changing attainment patterns.

##### 6.4.1 English

Figure 19 shows the participation and attainment rates of candidates in year 11 English qualifications from 1993 to 2006.<sup>20</sup> In all years from 1993 to 2006, higher proportions of females have participated in English School Certificate and subsequently NCEA. The participation gender gap varied from five to seven percentage points during School Certificate but since the introduction of NCEA the participation gender gap has decreased from five percentage points in 2004 to three percentage points in 2006.

<sup>20</sup> Data from 1993-2001 refers to School Certificate (those gaining grades A, B or C) and from 2004-2006 this refers to 14 credits or more at a typical NCEA level (NCEA level 1) or higher. Due to changes in the qualification system, data is unavailable for 2002 and 2003.

**Figure 19. Participation and qualification attainment in English in year 11, 1993-2006**

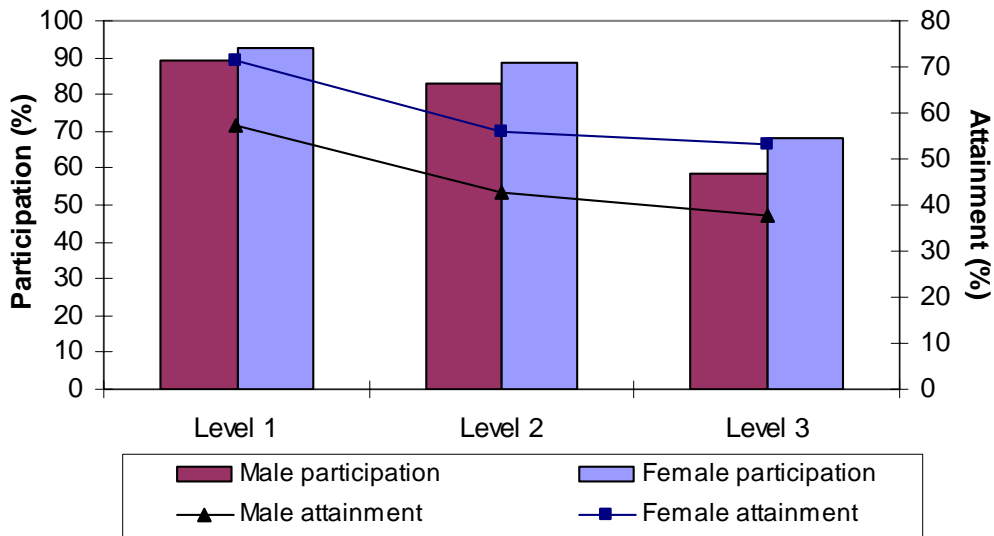
Even though gender disparities in English participation rates have reduced, there are still large gender differences in attainment rates. School Certificate results from 1993 to 2001 show gender differences of between 14 to 19 percentage points in favour of females. In general the gender difference decreased over this period due to a slight increase in the attainment rate of males. Since the full introduction of NCEA, English attainment rates in year 11 have increased for males and females. Females still have higher attainment rates than males, but from 2004 to 2006 this gender gap has decreased from 16 to 14 percentage points.

Figure 20 shows the participation and attainment rates in English at NCEA levels 1 to 3 by gender in 2006. The participation of males in English is lower than females at each NCEA level and the gender gap increases with increasing level. Females are more likely to attain at least 14 credits in English than males and this gender gap stays relatively steady at around 14 percentage points at each NCEA level.

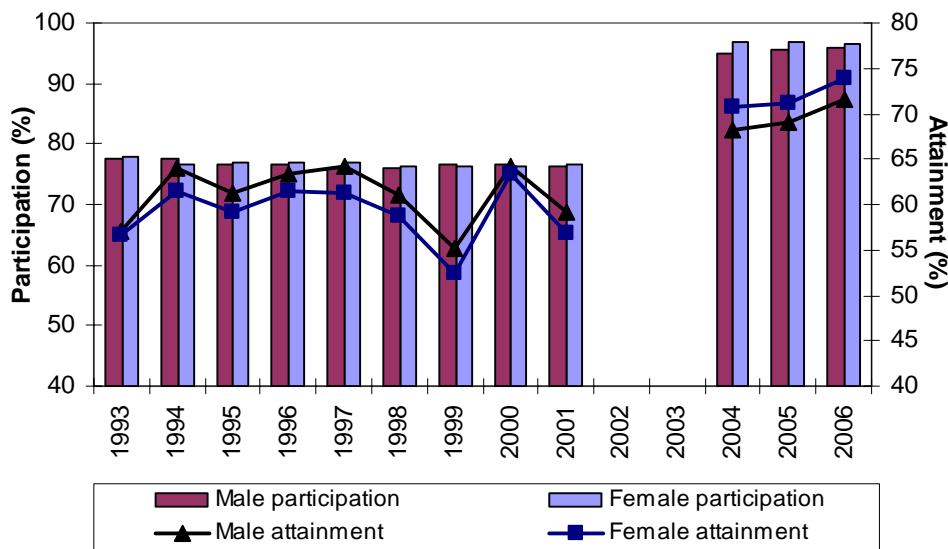
#### 6.4.2 Mathematics

The pattern of male and female participation and attainment in mathematics School Certificate/NCEA is very different from English as shown in Figure 21. Participation rates in School Certificate mathematics between 1993 and 2001 were very similar for males and females. In general rates for females were slightly higher but the difference never exceeded one percentage point over this time period. Gender differences in participation rates in NCEA mathematics are also small, and have decreased from two to one percentage points in favour of females.

**Figure 20. Participation and attainment in English at NCEA levels 1 to 3 in 2006**



**Figure 21. Participation and qualification attainment in mathematics in year 11, 1993-2006**

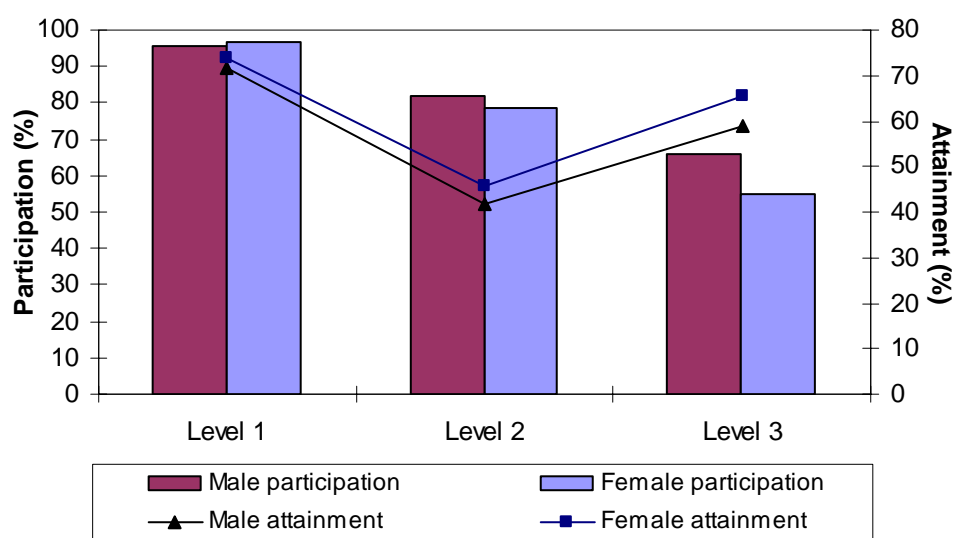


In School Certificate males performed better than females in mathematics, an average advantage of two percentage points between 1993 and 2001. This reached a peak of three percentage points in favour of males in 1997. However, since the full introduction of NCEA, females perform better than males in mathematics. This advantage to females has decreased from three to two percentage points between 2004 and 2006. In 2006, mathematics has the highest attainment rates for both females and males across the three main subject areas.

Figure 22 shows the participation and attainment rates in mathematics at NCEA levels 1 to 3 by gender in 2006. Participation rates for both males and females decrease with increasing NCEA level. The participation of males in mathematics is slightly lower than females at

NCEA level 1, but at level 2 males are more likely to participate and the over-representation of males increases further at level 3. In fact, at level 3 males are 10 percentage points more likely to participate in mathematics than females. However, at each level, higher proportions of females attain at least 14 credits in mathematics. The gender gap in favour of females also increases from two to six percentage points from NCEA level 1 to 3.

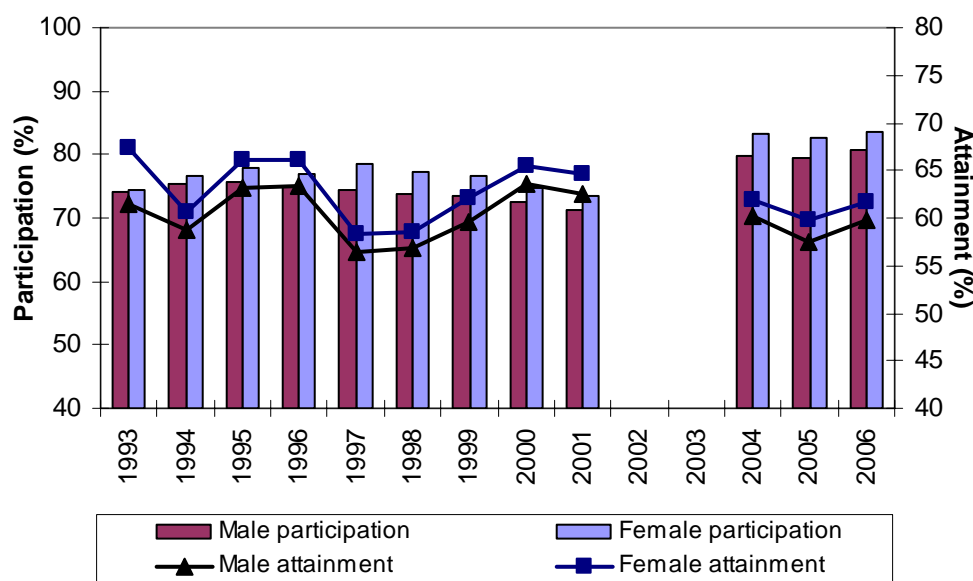
**Figure 22. Participation and attainment in mathematics at NCEA levels 1 to 3 in 2006**



### 6.4.3 Science

In year 11, science tends to be classed as one combined subject but the separate sciences are also available. The participation in the separate sciences in year 11 tends to be relatively low. Biology is the most popular science amongst females and Physics is most popular amongst males. Chemistry was more popular amongst males during School Certificate; however, there is no gender difference at NCEA. Performance in the separate sciences is variable over this time period due to the small numbers involved.

From 1993 to 2006 higher proportions of females have participated in combined science (Figure 23). The gender gap during School Certificate qualifications from 1993-2001 was between 0.5 and 4 percentage points. The largest gender gap of 4 percentage points was observed in 1997 but after this time a gradual decrease in the participation gender gap was observed. Once the NCEA was introduced females were still more likely to participate in science than males, a gender gap of around three percentage points that has remained relatively steady from 2004 to 2006.

**Figure 23. Participation and qualification attainment in science in year 11, 1993-2006**

Females are found to perform better in science than males but this gap is small. Other than the gender gap observed in 1993 (of 6 percentage points) it has remained around two to three percentage points in favour of girls. This is true for year 11 School Certificate and NCEA. Even though females performed better than males in science, the lowest attainment rate for females is in science across the three subject areas.

Figure 24 shows the participation and attainment rates in science<sup>21</sup> at NCEA levels 1 to 3 by gender in 2006. Participation rates for both males and females decreases with increasing NCEA level. Even though there is not much difference in the participation rates between levels 2 and 3, compared to English and mathematics there is a large decrease in science participation after year 11. Gender differences in total science participation rates is small, with slightly higher participation of females at level 1, this slight advantage however, changes to males at levels 2 and 3. At each level, higher proportions of females attain at least 14 credits in science. This gender difference is small but increases from two to five percentage points from NCEA level 1 to 3.

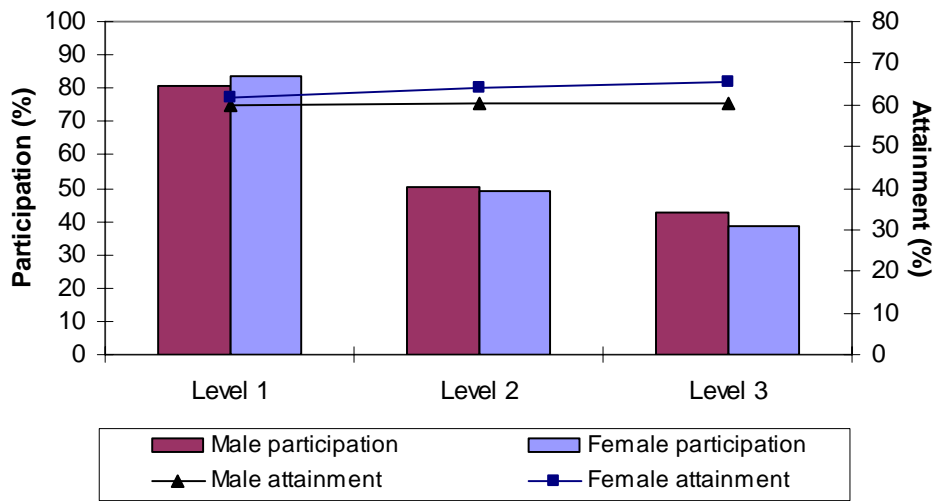
Gender differences are small when looking at the total participation and attainment rates in the sciences. However, this hides some apparent differences between the individual sciences. At NCEA levels 2 and 3, the sciences tend to be taught as individual subject areas, and Figure 25 shows the participation and attainment rates in biology, chemistry and physics at NCEA level 2 and 3 in 2006.<sup>22</sup> Much higher proportions of females participate in biology, whereas in physics much higher proportions of males participate. In chemistry the difference is much smaller, but there is a slight advantage to girls. Gender differences in attainment rates are small for the individual sciences, but females do out perform males.

<sup>21</sup> This is the combined totals of all the sciences (agricultural and horticultural science, biology, chemistry, physics and science (Core)).

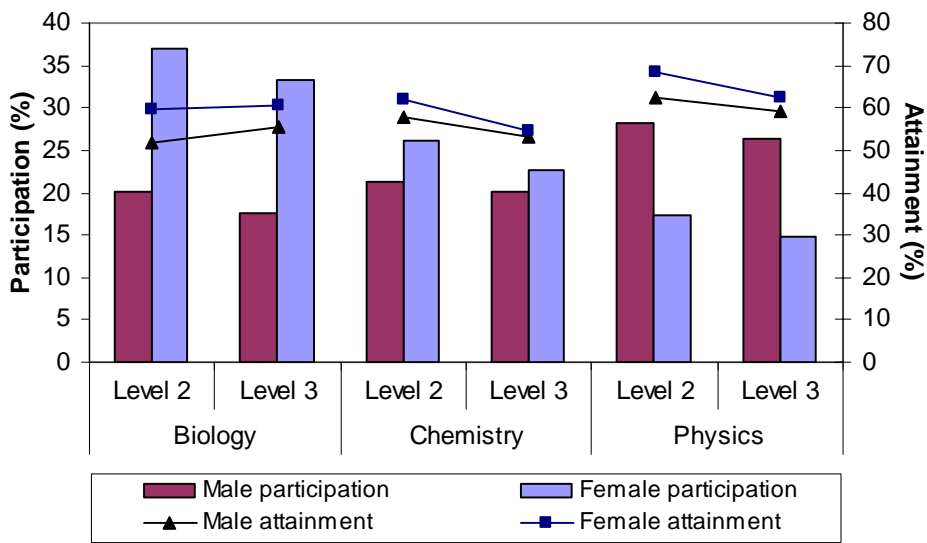
<sup>22</sup> Agricultural and horticultural science is not shown as at NCEA level 2 and 3 as participation rates are small at around two percent.



**Figure 24. Participation and attainment in science at NCEA levels 1 to 3 in 2006**



**Figure 25. Participation and attainment in biology, chemistry and physics at NCEA levels 2 and 3 in 2006**



## Chapter 7- Highest Attainment of School Leavers

A formal school qualification is a measure of the extent to which young adults have completed a basic prerequisite for higher education and training, or many entry-level jobs. This chapter looks at the highest attainment of school leavers and the changes that have occurred since 1993.

### Key Findings

- Females tend to stay at school longer and have better attainment than males across all ethnic groups.
- The proportion of students leaving school with little or no formal attainment has decreased since the introduction of the NCEA. However, across all years males are more likely than females to leave school with little or no formal attainment but this difference has decreased over recent years.
- In 2006, over 20 % of Māori males, and females, left school with little or no formal attainment.
- Historically females are more likely to gain University Entrance or higher qualifications than males. Since 1993 the gender difference has grown and in 2006 females were 31 % more likely than males to gain University Entrance or higher qualifications.
- Māori and Pasifika males are least likely to gain University Entrance or higher qualifications, but the proportion of Māori and Pasifika females is also low and of concern.

The monitoring of the highest attainment of school leavers is based on the annual 1st March survey of secondary and composite schools. These statistics include all full-time regular students, full-time adult students and special education class students who left school during the period 1 March 2006 to 28 February 2007, to go on to further education, training, the workforce or other activities.

### 7.1. School Leavers

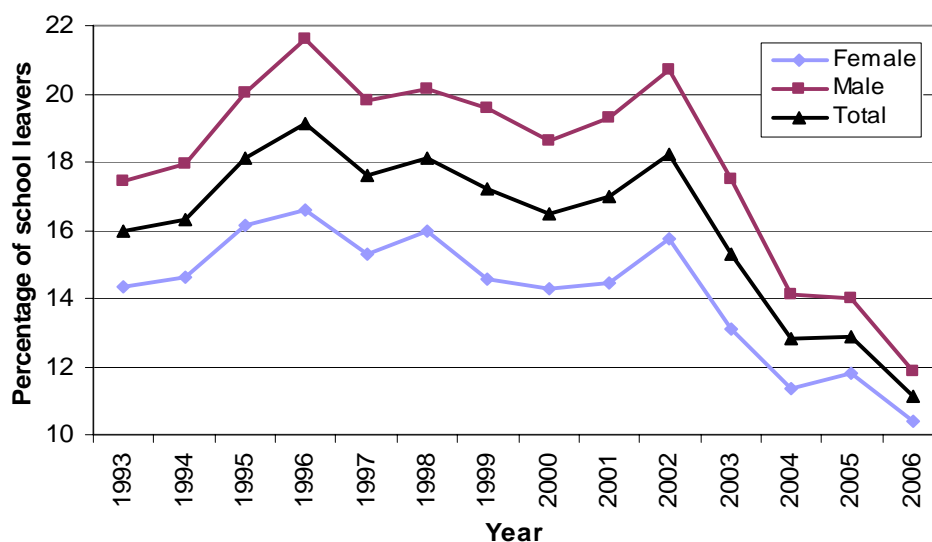
The percentage of school leavers by year level and gender are shown in Table 4 from 2004 to 2006. Females tend to stay at school longer with 65 % leaving from year 13 in 2006 compared to 58 % of males. For both genders the proportion of students staying longer at school has increased since 2004. More male students tend to leave school in year 11 (14 % compared to 11 % of females) and year 12 (24 % compared to 22 % of females).

**Table 4. The percentage of school leavers by year level and gender, 2004 to 2006**

Year Level	Male			Female		
	2004 (%)	2005 (%)	2006 (%)	2004 (%)	2005 (%)	2006 (%)
Year 9	0	0	0	0	0	0
Year 10	3	2	2	2	1	1
Year 11	15	15	14	11	11	11
Year 12	26	25	24	22	22	22
Year 13	54	55	58	62	62	65
Year 14	3	2	1	2	2	1
Year 15	0	0	0	0	0	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

## 7.2. School leavers with Little or No Formal Attainment<sup>23</sup>

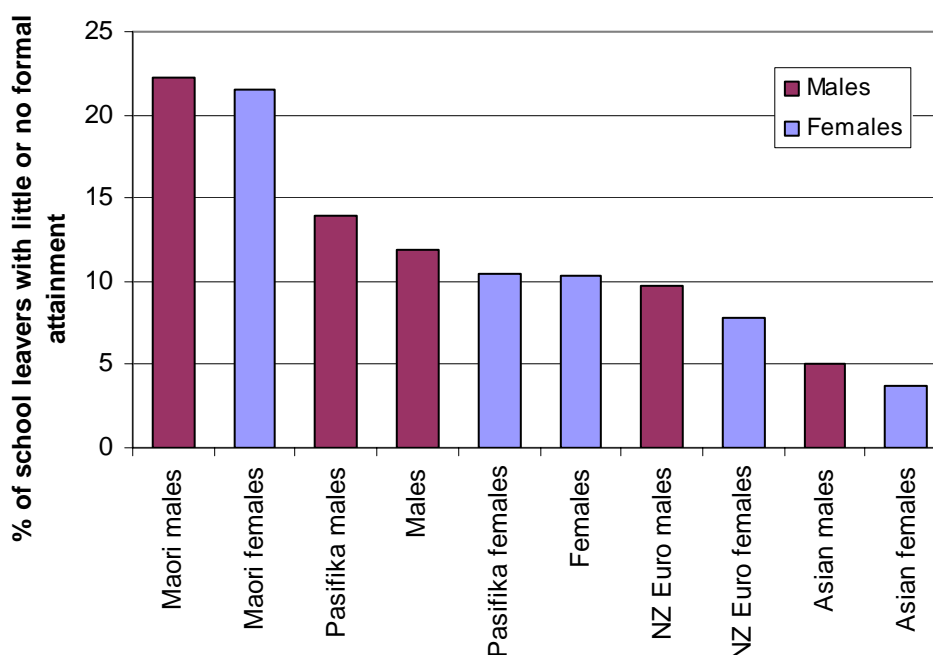
In 2006, 11 % of all school leavers left school with little or no formal attainment (Figure 26). Between 1993 and 2002 there was little change in the proportion of students leaving with little or no formal attainment, but from 2002 onwards there has been a steady decline in the proportion of school leavers in this group. Across all years males were more likely to leave school with little or no formal attainment; however this gap has narrowed considerably over this time. For example in 2001 males were around 33 % more likely to leave school with little or no formal attainment, this had reduced to 14 % in 2006.

**Figure 26. School leavers with little or no formal attainment by gender, 1993-2006**

<sup>23</sup> From 2005, this includes students with between 0 and 13 credits at any NCEA level. Between 2002 and 2004, this included students with between 0 and 13 credits at NCEA level 1 only. Prior to 2002, this included students with fewer than 12 credits at National Certificate.

Figure 27 shows the proportion of school leavers with little or no formal attainment by gender and ethnic group in 2006. Māori students are most likely to leave school with little or no formal attainment, with around 22 % of Māori male and female school leavers in this group. Asian students on the other hand are least likely to leave school with little or no formal attainment. There is also a clear correlation between socio-economic mix of the school the student attended and the percentage of school leavers with little or no formal attainment. Students in low decile schools are more likely to leave school with little or no formal attainment than students in high decile schools.

**Figure 27. School leavers with little or no formal attainment by gender and ethnic group, 2006**

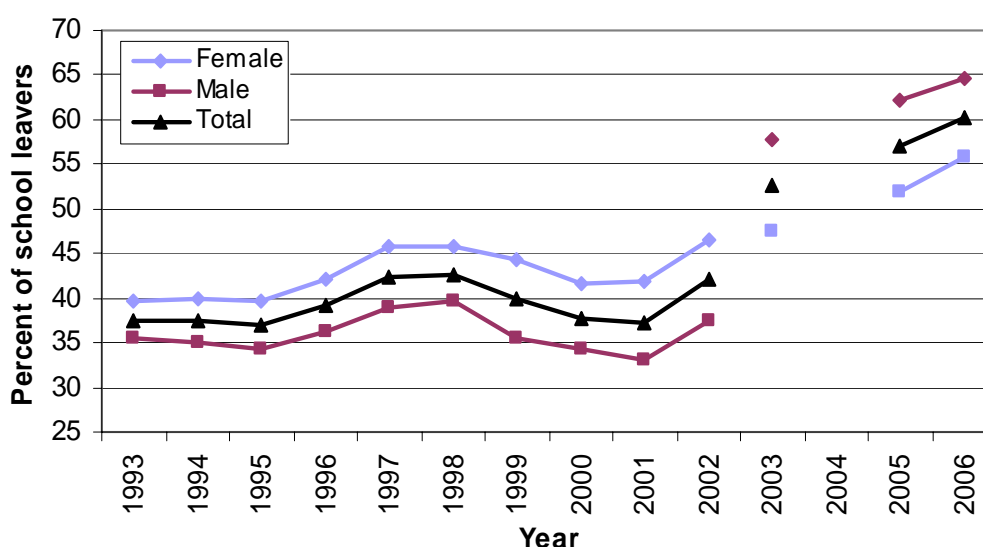


In all years since 1993, males are more likely to leave school with little or no formal attainment than females. It is encouraging to see that this gender difference has decreased over time, but the proportion of Māori in this group continues to be an area of concern.

### 7.3. School leavers with NCEA Level 2 or Higher Qualification<sup>24</sup>

Between 1993 and 2006, female school leavers performed better than male school leavers (Figure 28). In 2006, 60 % of all school leavers achieved at least NCEA level 2, but higher proportions of females (65 %) than males (56 %) gain these qualifications. The proportion of school leavers with NCEA level 2 or higher has increased slightly for males and females since 2005.

<sup>24</sup> A direct comparison can not be made between rates up to and including 2002 with rates for 2003 onwards, due to the change in qualification structure. Due to methodological changes in the allocation of attainment levels in 2004, for leavers achieving a qualification between little or no formal attainment and UE standard, the percentage of leavers with at least NCEA level 2 in 2004 is not comparable with other years, and has been omitted.

**Figure 28. School leavers with NCEA level 2 or higher by gender, 1993-2006**

In 2006, Māori males (34 %) were least likely to leave school with an NCEA level 2 qualification or higher. However, the proportion of Māori females (40 %) and Pasifika males (45 %) leaving school with at least a level 2 qualification are also of concern. There is also a clear correlation between socio-economic mix of the school the student attended and the percentage of school leavers with at least an NCEA level 2 qualification. Students in low decile schools are less likely to leave school with an NCEA level 2 or higher qualification than students in high decile schools. In 2006, the percentage of males in decile 1 to 8 schools leaving school with at least an NCEA level 2 qualification was lower than the national average. In comparison, the percentage of females in decile 1 to 5 schools to gain a level 2 or higher qualification was lower than the national average.

#### 7.4. School leavers with University Entrance or Higher Qualification<sup>25</sup>

An entrance qualification enables students to go directly into further tertiary study at degree level. As shown in Figure 29, 36 % of school leavers achieved at least an entrance qualification in 2006. Female students achieved at higher rates than male students, with 41 % of females and 31 % of males attaining at least an entrance qualification. In the years 1993-2006 females have been more likely than males to achieve an entrance qualification or higher. Over this period the proportion of male and female school leavers gaining an entrance qualification or higher has increased, but the rate of increase has been higher for females than males resulting in a widening of the gender gap. In 1993, females were 18 % more likely than males to gain an entrance qualification or higher, however in 2006 this had increased to 31 %.

<sup>25</sup> Includes those school leavers with University Entrance, year 13 qualifications or higher qualifications.

**Figure 29. School leavers with University Entrance or higher by gender, 1993-2006**

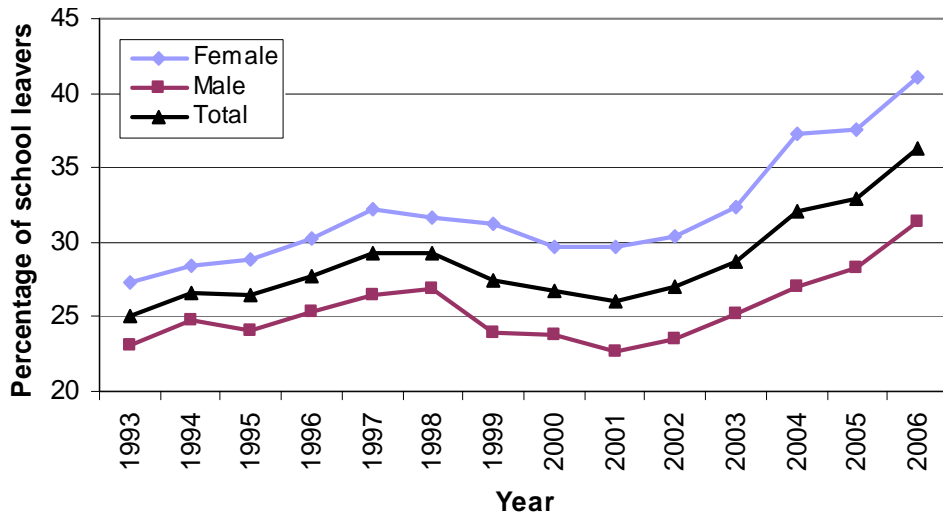
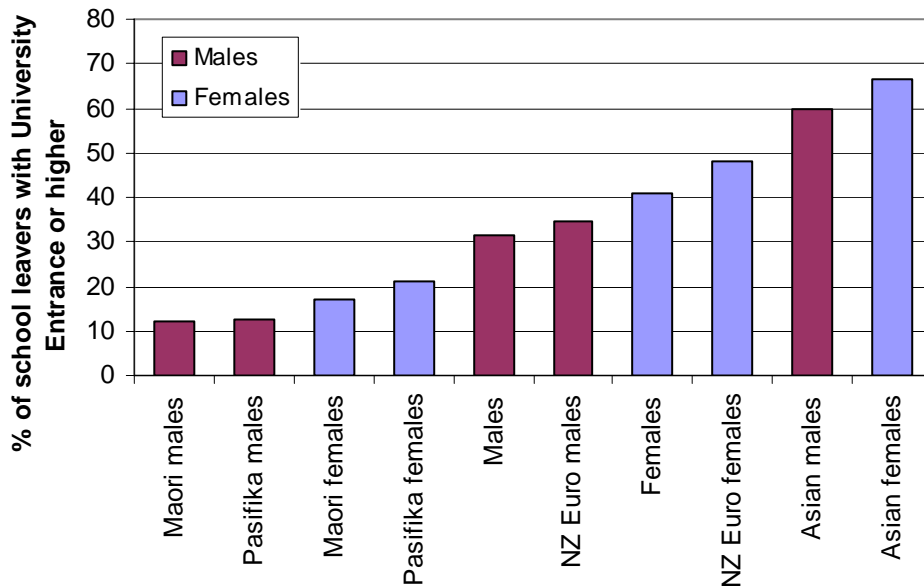


Figure 30 shows the proportion of school leavers with University Entrance or higher by gender and ethnic group in 2006. Māori and Pasifika males were least likely to leave school with University Entrance or higher, with only around 12 % of Māori males and 13 % of Pasifika males in this group. However, the proportions of Māori and Pasifika females in this group are relatively low and also of concern.

**Figure 30. School leavers with University Entrance or higher by gender and ethnic group, 2006**



There is also a clear correlation between socio-economic mix of the school the student attended and the percentage of school leavers with University Entrance or higher. Students in low decile schools are less likely to leave school with University Entrance or higher than

students in high decile schools. The percentage of male students leaving school with University Entrance or higher qualifications is lower in decile 1 to 8 schools than the national average, whereas the percentage of females in decile 1 to 5 schools to gain University Entrance or higher is lower than the national average. Also, of particular note is the smaller gender difference in University Entrance attainment in lower decile schools than higher decile schools. For example the gender gap is 4.7 percentage points in decile 1-3 schools, in favour of girls, this increases to 11.7 percentage points in decile 4-7 schools and 11.8 percentage points in decile 8-10 schools.

## Chapter 8- Longer Term Outcomes

This chapter looks at the longer term outcomes of students after they leave school, both in tertiary education and the labour market.

### Key Findings

- Overall, males are less likely than females to participate and attain qualifications in tertiary study; however this does vary depending on the field of study.
- In 2006, 20 percentage points more females than males participated in degree level (level 7) courses and 26 percentage points more females than males attained qualifications at degree level.
- The participation of Māori and Pasifika males in tertiary education, especially at higher levels, is very low.
- Males and females with tertiary qualifications, even sub-degree qualifications, have greater labour force participation and, on average, earn higher incomes.
- New Zealand males with an upper secondary qualification are 43 % less likely to be unemployed than males without an upper secondary qualification.

### 8.1. Direct Transition to Tertiary Education

Although tertiary education delays the start of paid employment, it substantially increases lifetime earnings and is a good investment both for the individual and society. Not all school leavers transition to tertiary education. A number of students take a break between schooling and tertiary education and some join the labour force. Of the 2005 school leavers 56 % transitioned direct to tertiary education. Of those transitioning direct to tertiary education, 52 % were female and 48 % were male. However, this gender difference varies by ethnic group. The proportion of NZ European and Asian males and females transitioning direct to tertiary education is similar; however, Māori and Pasifika males are less likely than Māori and Pasifika females to transition direct to tertiary.

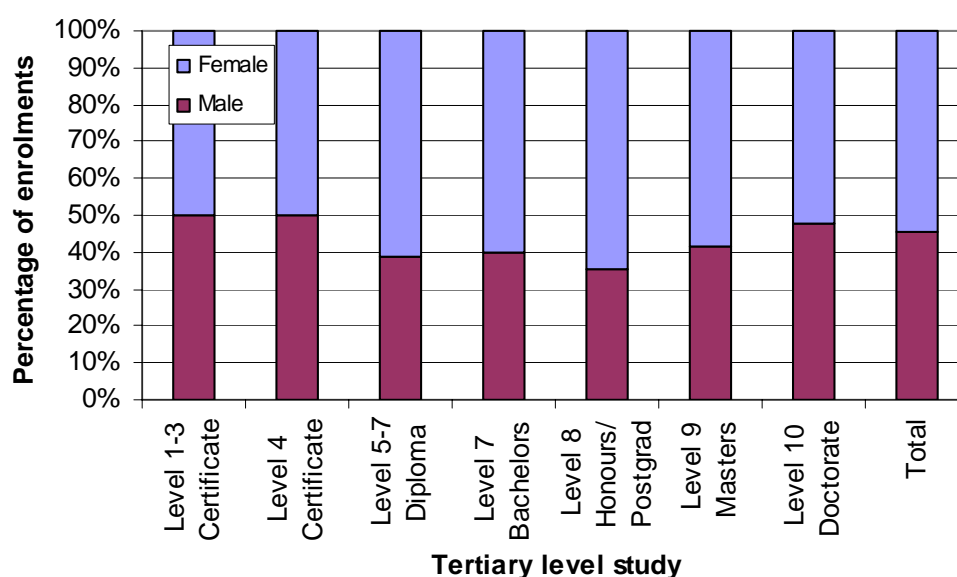
Of the students transitioning directly to tertiary education, females are more likely than males to enrol in a degree level course. Of the 2005 leavers transitioning directly to tertiary, 11 percentage points more females than males enrolled in degree level courses. However, males were more likely than females to enrol in lower level certificate courses. These differences arise as a result of the differences in qualifications with which students leave school. Students with University Entrance or higher are most likely to proceed directly to tertiary education and to enrol in degree level courses. As females are most likely to leave school with University Entrance (section 7.4) higher numbers of females are enrolled in degree level courses. Whereas slightly more males than females leave school with little or no formal qualification, and more males are enrolled in lower level certificate courses than females.



## 8.2. Tertiary Participation and Qualification Attainment

Higher levels of education are associated with better health and lifestyles, and lower crime rates. Individuals with tertiary qualifications, even sub-degree qualifications, have greater labour force participation and, on average, earn higher incomes. Females are more likely than males to participate in tertiary study across all age groups except the under 18 group. The majority of the under 18 age group are participating in level 1-3 certificate courses at tertiary. Figure 31 shows the participation in tertiary education by level of study and gender in 2006. Females are more likely to participate in tertiary study than males. The gender differences are largest in level 5 to 9 tertiary courses. At degree level (level 7) 20 percentage points more females than males participate. In 2006, this equated to over 26,000 more females than males enrolled.

**Figure 31. Participation in tertiary education by level of study and gender in 2006**



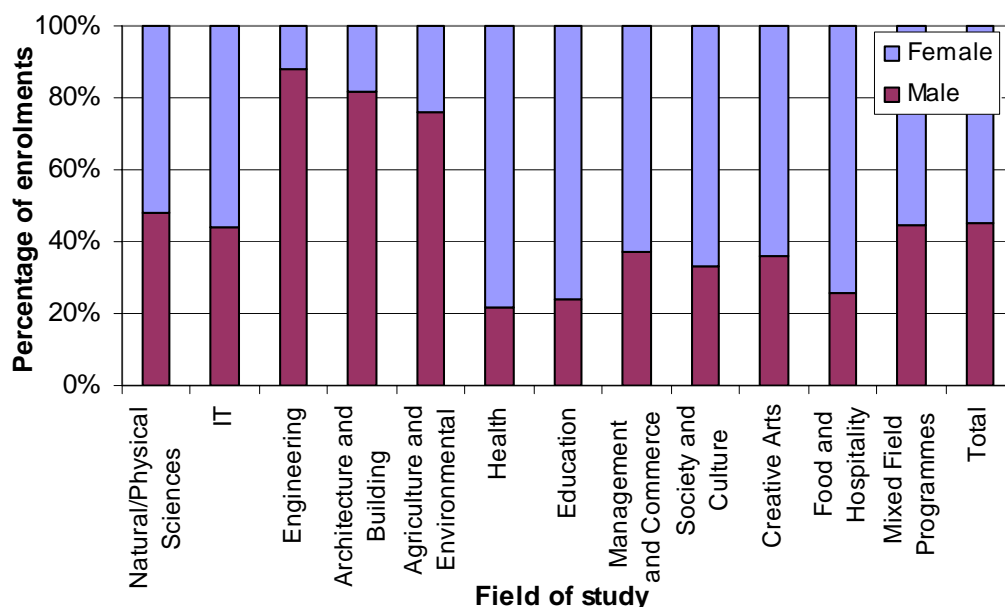
Overall, females are more likely to participate in tertiary study than males but there are large gender differences within different fields of study at tertiary level. Gender differences in tertiary subject choices are not limited to New Zealand and are observed internationally across OECD countries. Figure 32 shows the New Zealand participation in tertiary study by field and gender in 2006. Males are more likely to participate in Engineering, Architecture and Building, and Agriculture and Environmental courses, whereas females are more likely to participate in all other fields of study.

Not all enrolments end as qualifications, but over the last decade there have been increases in the number of tertiary qualifications attained by males and females. However, a gender split in the percentage of qualifications gained<sup>26</sup> at each tertiary level exists. This is shown in Figure 33 for 2006. Females are more likely to attain tertiary education qualifications. Across all levels females were 22 percentage points more likely to attain a qualification. At degree level (level 7), there was a 26 percentage point gender difference in favour of females.

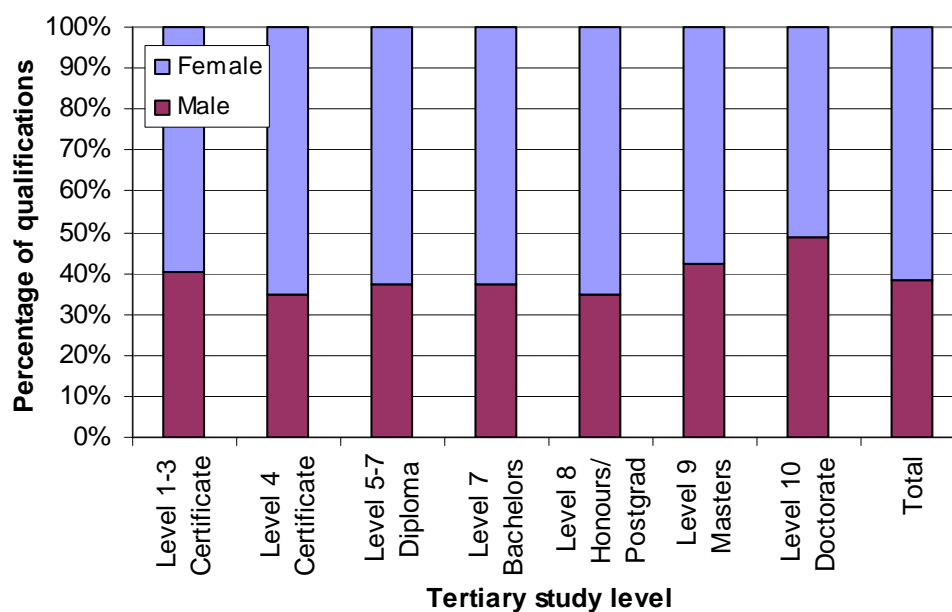
<sup>26</sup> Data relates to domestic students only and can be found at [http://educationcounts.edcentre.govt.nz/statistics/tertiary\\_education/retention\\_and\\_achievement](http://educationcounts.edcentre.govt.nz/statistics/tertiary_education/retention_and_achievement)

Female attainment rates are found to exceed those for males in just over half of the OECD countries, but New Zealand is one of only four countries where the gender difference in attainment rate is significantly higher.<sup>27</sup>

**Figure 32. Participation in tertiary education by field of study and gender in 2006**



**Figure 33. Qualification attainment in tertiary education by level of study and gender in 2006**



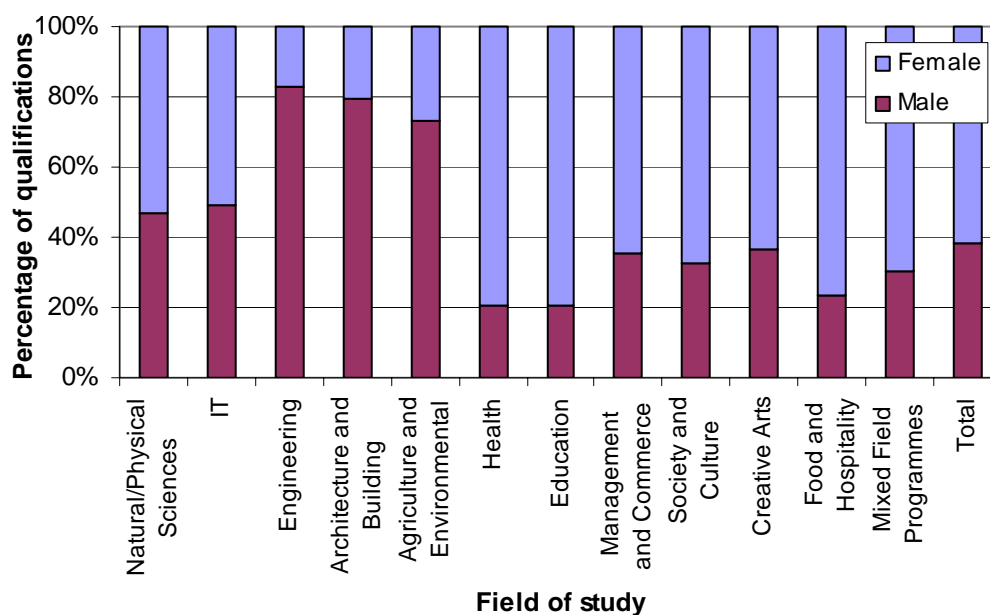
<sup>27</sup> OECD Education database.

Figure 34 shows the qualification attainment by field of study and gender in 2006. Even if the gender differences in participation rates are taken into account, males are less likely than females to attain qualifications in all fields of study other than IT (where males are more likely to attain qualifications) and Society and Culture, and Creative Arts (where males and females are equally likely to attain qualifications).

Across all OECD countries, health and welfare subjects are the most popular for females and subjects relating to engineering, manufacturing and construction are most popular for males.<sup>28</sup> In New Zealand about 20 % of health and welfare graduates are males, which is lower than the OECD average of 29 %. In engineering, manufacturing and construction subjects males make up about 70 % of graduates in New Zealand compared to the OECD average of 75 %.

Such differences in subjects studied at tertiary level both reflect and influence different career choices for males and females. These differences will contribute to gender differences in the labour market.

**Figure 34. Qualification attainment in tertiary education by field of study and gender in 2006**



### 8.3. Participation in the Labour Market

Employment rates of females are below employment rates of males in all OECD countries but nearly everywhere the gap between male and female employment rates has been falling.<sup>29</sup> The differences in employment rates tend to be affected by the more dominant role females usually play in child rearing compared to males.

In New Zealand and across most OECD countries employment rates rise with educational attainment. Individuals with tertiary qualifications, even sub-degree qualifications, have greater labour force participation and, on average, earn higher incomes. Individuals with little

<sup>28</sup> OECD Education database.

<sup>29</sup> Education at a Glance. (2007). OECD Indicators.

or no formal educational attainment are both less likely to be labour force participants and more likely to be unemployed. For example males with an upper secondary qualification are 16 % more likely to be employed and 43 % less likely to be unemployed than males with a qualification below upper secondary.

## **Discussion/Conclusions**

The data presented on New Zealand boys' achievement in this report has shown that many boys are achieving at school, including Māori and Pasifika boys, and that there has been no marked decline in the performance of either boys or girls over the last five years. However, it has highlighted some issues in the area of boy's educational engagement and achievement.

The most striking achievement issue is in literacy where a literacy gender gap in favour of females develops after the start of schooling and persists throughout the education system. In general, boys perform less well in reading and, in particular, in writing than girls. Boys are also over-represented in the lowest performing literacy group of students and under-represented in the highest achieving group. Of particular concern is the proportion of Māori and Pasifika boys in these groups.

Regular school attendance is essential to encourage all young people to stay at school until at least the age of 16 and benefit from being there. The school leaving patterns of boys' and their over-representation in stand-downs, suspensions and exclusions is a serious issue. Males account for over 70 % of stand-downs and suspensions and their over-representation increases in the formal removal of students from school (exclusions and expulsions). Early leaving exemptions are also more frequently granted to male students, but the rate for Māori males (20 %) is of key concern.

In addition, females tend to stay at school longer and attain higher formal qualifications than males. Higher proportions of males than females leave school with little or no formal attainment but this gender difference has decreased over time. Males are also less likely to leave school with an NCEA level 2 qualification or higher, or University Entrance or higher. In 2006 females were 31 % more likely than males to gain University Entrance or higher qualifications. Of particular concern is the very low level of Māori and Pasifika males attaining University Entrance.

These gender differences in qualification attainment also impact on tertiary education participation. Even though males and females are equally likely to transition straight to tertiary education, the higher proportion of females with University Entrance results in higher proportions of females enrolled in degree (level 7) level courses, whereas more males enrol in lower level certificate courses. As well as having lower participation rates in tertiary education males are also less likely to attain a tertiary qualification.

Males and females with tertiary qualifications, even sub-degree qualifications, have greater labour force participation and, on average, earn higher incomes. For males in particular, if they do not have an upper secondary qualification they are much more likely to be unemployed than males with at least an upper secondary qualification. So, addressing low educational attainment will have long term benefits for the individual and society.

The Ministry of Education is committed to ensuring that all children achieve to their full potential in the education system. Even though this report shows that many boys are succeeding at school, it also highlights some issues in the area of boys' literacy, engagement and qualification attainment. In order to fully understand these gender differences it is

important to draw on the literature on early childhood, biological and cognitive differences, cultural differences, pedagogical approaches, assessment methods and socio-economic factors such as family income or parental education.

This report should sit alongside the research literature to put the gender debate in context. The literature reports a number of research studies and initiatives that focus on raising achievement and these have built a knowledge base of effective practice and innovation in teaching boys. The challenge now is for schools and their communities to engage with some of the issues faced by boys and to build this knowledge base into school and classroom practice.