Critical Connections:

High-Ability Students' Perceptions of Factors that Influence NZQA Scholarship.

A Mixed Method Study

By

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A thesis

submitted to the Victoria University of Wellington

in fulfilment of the requirements for the degree of

Doctor of Philosophy

in Education.

Victoria University of Wellington

2009

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Glossary

AME	-	A series of workbooks to support student learning in NCEA
CHOGM	-	Commonwealth Heads of Government Meeting
DMGT	-	Differentiated Model of Giftedness and Talent
ERO	-	Education Review Office
GATE	-	Gifted and Talented Education
LOL	-	Laugh out loud
NCEA	-	National Certificate in Educational Achievement
NZQA	-	New Zealand Qualifications Authority
SRG	-	Scholarship Reference Group
IHC	-	Intellectually Handicapped Children
WOW	-	World of Wearable Arts

Abstract

This mixed methods study involved 332 high school students and investigated those factors that students perceived as having facilitated their success in New Zealand Qualifications Authority (NZQA) Scholarship. A key finding from this study suggests that New Zealand Scholarship students form a connection with at least one teacher and consider this relationship to be a catalyst in their success. Family, peers and friends play a lesser but still important role in the student's success, providing support for the student. These successful students reported reduced time spent in extracurricular activities in order to prepare for subjects in which they believed they would be successful. Students related experiences where teachers, schools and some learning communities were not supportive of their aspirations for high academic achievement, and described the impact of this on their quest for Scholarship success. This research has identified a number of aspects relating to high academic achievement and New Zealand secondary education that require further investigation. These include an investigation into those practices of teachers who work with high-ability students to yield greater understanding of the beliefs that teachers hold about teaching high-ability students and the ways in which these beliefs affect student outcomes.

Acknowledgements

There are many people without whom this project would never have been completed. I wish to thank:

The participants, those talented and inspirational students who shared their perceptions and experiences with me. It has been a privilege to have had the opportunity to access your thoughts and opinions. Thank you to the two teachers who were interviewed as part of this study: I have no doubt that you are both Teacher-Catalysts.

My superb supervisors: Professor Luanna Meyer at Victoria University of Wellington and Associate Professor Tracy Riley at Massey University. Thank you not only for your support and confidence in me, but for challenging my thinking and helping me locate that 'higher level'.

The New Zealand Qualifications Authority staff who assisted with the all-important mail-out to participants, most especially Kirsty Weir and James Chal.

The Victoria University Faculty of Education Research Committee that provided me with a Research Fellowship Award enabling me to devote a large portion of uninterrupted time to this project. Thanks too to the Jessie Hetherington Research Centre for contributing to my study through an Advanced Degree Award and an Internal Thesis Research Grant.

My friends and colleagues, especially: Carolyn, Robyn, and Chris who have shared my journey and been my sounding boards, providing valuable critique and encouragement. Thanks to Flaviu Hodis who has assisted me with my statistical data and Susan Kaiser who is a wizard at many things, including publishing and formatting.

My extended family: my sister Debbie who set the PhD ball in motion and who ensured it gathered and maintained momentum; my son-in-law Michael who provided support and valuable comment; and Courtney who has never faltered in her belief in my ability to finish.

My four amazing, capable children: Jemma, Blake, Sam and Kit who have now tolerated (and encouraged) their mother studying for 11 consecutive years. Special thanks to Shelley who has helped to keep our home functioning by doing (unasked) all those little chores I have not found time to do, and to Misty (the dog) who has sat patiently at my feet for the past umpteen years.

Finally, thank you to my wonderful husband Michael who has always, determinedly believed the final chapter would be written. With your help and support all things seem possible.

I dedicate this thesis to Sam who has taught me about courage, tenacity and the importance of connections.

CHAPTER 1
Introduction

This research has evolved from the merging of an opportunity provided by the Scholarships examination process and the lack of New Zealand research identifying profiles of the factors important to nurturing achievement in our top students. The project investigated the link between New Zealand's "very top students" who were rewarded for their results in the Scholarship examination in 2006 and 2007, and the factors which have influenced their learning practices during their high school years (Ministry of Education, 2005, p. 3). Overseas research has described the factors that have influenced successful gifted adults or talented teenagers (Bloom, 1985; Csikszentmihalyi, Rathunde & Whalen, 1993). However, there is a paucity of research that describes the factors that have influenced the gifted *New Zealand* adolescent. While there exists no agreed process or measure to identify this population in New Zealand, the evident valuing by the New Zealand Ministry of Education of the top high school scholars through the provision of monetary rewards does provide identification of a group that most would consider represents gifted and talented students. As the Scholarship Reference Group (SRG) Report stated "a key goal for Scholarship should be to not only extend our most able students but also to identify a small number of the very top students" with identification of top scholars being restricted to "within a range of 2% to 3% of the cohort in each subject" (Ministry of Education, 2005, p. 3).

Thus, it is important to clarify that this research did not seek to identify all students who comprise "New Zealand's gifted Year 13 students" but instead accepted Scholarship success as affirmation of the status of a particular group of young people who had demonstrated outcomes associated with academic giftedness. It is also important to state that there are likely to be other New Zealand students meeting different criteria for identification as gifted and talented who have not been included in this research. However, existing overseas research and theory that quantifies the percentage of gifted and talented students in any given cohort would suggest that this group of young people who gained New Zealand Qualifications Authority (NZQA) Scholarship do represent gifted and talented adolescents (Gagné, 2003; Renzulli, 2002). Based on this sample, internal and external dimensions affecting achievement and performance were examined through retrospective self-reports in which students

provided information regarding aspects that they perceived as having an impact on their success (Bloom, 1985; Csikszentmihalyi et al., 1993; Gagné, 2003; Gagné & Schadaer, 2006; Leung, Conoley & Scheel, 1994).

A mixed methods approach was used to investigate factors that had assisted New Zealand's top secondary students achieve success in Scholarship examinations. It is hoped that the data gathered have generated hypotheses for future research which focuses on the factors that influence student high achievement. This project built on international research findings regarding factors which have been shown to have an impact on the achievement of gifted and talented adolescents (Bloom, 1985; Csikszentmihalyi et al., 1993). Based on this literature, an on-line survey and interviews were designed to investigate self-reported perceptions of Scholarship recipients regarding factors important to their achievement and accomplishments (Berg, 2004).

Moltzen's (2005) retrospective research into gifted New Zealand adults has added to a small but growing body of New Zealand literature pertaining to identification of, and planning for gifted students (Ministry of Education, 2001; McAlpine & Reid, 2004; Taylor 2001). In addition to Moltzen's work, there is a research report commissioned by the Ministry of Education evaluating planned approaches to teaching gifted and talented students in New Zealand (Riley, Bevan-Brown, Bicknell, Carroll-Lind & Kearney, 2004). However, it appears that New Zealand researchers have not yet empirically investigated the factors that are catalysts in facilitating high achievement in this country's most able students. Therefore, any review of literature pertaining to gifted adolescents must include not only New Zealand research but also that of international researchers.

This thesis is organised into chapters. This initial chapter serves to outline the study for the reader, providing an overview of the project and a brief look at the literature that informed it. Chapter Two provides a comprehensive retrospective review of New Zealand and international literature as it relates to the findings of this study. Chapter Three describes methodological approaches to research and survey design, while Chapter Four outlines methodological considerations as they pertained to this study. Chapter Five presents the findings and interprets the data. Chapter Six discusses theoretical propositions that have emerged from the data, and Chapter

Seven provides discussion and suggests implications of these findings and theories for high-ability students, as well as teachers and administrators of those aiming for high academic achievement in both New Zealand and overseas.

CHAPTER 2

Review of the Literature

This chapter reviews the literature pertaining to giftedness and talent, with consideration of definitions of giftedness and factors identified by others as those that facilitate students in achieving 'top' academic success. The review will also track the development of Scholarship in its present form and briefly background the NZQA examination system now implemented in New Zealand secondary schools. Finally, the review will consider the factors that determined the format of the proposed student surveys. The review provides a brief overview of literature that informed the data collection sources initially and a retrospective review of literature as it related to the findings of the research and the theoretical propositions that have emerged. However, before commencing the review, it is important to discuss the terminology used to describe the students in this study.

As already stated, this research investigates influences on a sub-set of students who would be regarded as "gifted and talented" i.e., those who are academically high achievers. It does not purport to have investigated the influences on the total population of those who would be regarded as "gifted and talented." The Scholarship Reference Group (SRG) Report stated "a key goal for Scholarship should be to not only extend our most able students but also to identify a small number of the very top students" with identification of top scholars being restricted to "within a range of 2% to 3% of the cohort in each subject" (Ministry of Education, 2005, p. 3). Clearly, those students who gained NZQA Scholarship are amongst New Zealand's most able students having evidenced high academic achievement through their NZQA Scholarship results that place them in the top 2% to 3% of that cohort.

The Terminology

Much of the literature surrounding high academic achievement uses the phrase 'gifted and talented', with some usage interchangeable and other being singular as in the use of either term 'gifted' or 'talented' (Passow & Rudnitski, 1995; Callahan, 1997). The terminology that surrounds the construct of giftedness has attracted some discussion, with Borland (1997) suggesting the term 'gifted' is "about as popular in the world of education as the term *virus* in computer circles" (p. 7).

Other international terms that describe groups of high ability students include ‘able’, ‘bright’ and ‘exceptional’, with each phrase evoking a different attitude – and often different meanings – amongst both educators and the public (McAlpine, 2004). Although he offers no evidence to support the statement, McAlpine (2004) suggests that internationally ‘gifted’ or ‘gifted and talented’ remain the preferred terms” (p. 38). It had initially been this researcher’s preference to use only the terms ‘students of high ability’ or ‘high academic ability’ to describe this group of Scholarship recipients. However, as the literature shows, these and other descriptions are often interchangeable, although historically this was not the case.

The Construct of Giftedness

Understandings relating to perceptions of giftedness have changed over time, with early definitions relating to intellectual giftedness and more recent descriptions relating to a multi-category approach (Borland, 1997; Callahan, 1997; McAlpine, 2004; Schroth & Helfer, 2009). Historically, giftedness was conceptualised by IQ scores (Hollingworth, 1925; Terman, 1925) and talent was viewed as a lesser demonstration of activity or intelligence (Syphers, 1972).

Current thinking suggests the concept is based around a number of implicit and explicit theories, with explicit theories emanating from those who have studied giftedness and implicit theories being the ‘layperson’s’ concept (Kaufman & Sternberg, 2008). The early, narrow concepts of giftedness that related to intelligence have evolved to include a multi-category approach (Callahan, 1997; Moltzen, 2004). One outcome of this wider, multifaceted, approach to giftedness is greater attention to what is defined as talent and the distinctive components that – arguably – distinguish it from giftedness (Feldhusen, 1992; Gardner 1993). This section explores a number of explicit theories of domain specific (e.g. Gardner’s Multiple Intelligences), systems (e.g. Renzulli’s Three-Ringed Conception of Giftedness) and developmental (e.g. Gagné’s Differentiated Model) models of giftedness.

As a proponent of domain specific acumen, Gardner provides a broader concept of giftedness and intelligence (1983; 1993, 1999). His theory of multiple intelligences was originally based on the identification of seven intelligences but has increased to now include nine. The original identified intelligences were domain specific, and included spatial, musical, bodily-kinaesthetic, intrapersonal, interpersonal, linguistic

and logical-mathematical intelligence. The two recent additions are naturalistic and existential intelligence. Gardner (1993) suggests that identifying these intelligences is possible through observation of students when they interact with materials that relate to each of the domains or intelligence areas.

Sternberg's Triarchic Model attempts to broaden traditional definitions of giftedness (Sternberg, 1996, 2003; Sternberg & Grigorenko, 2000). It proffers another explicit theory of giftedness, suggesting three distinct forms of intelligence: analytic, creative and practical intelligence. This theory is based on the understanding that those factors that encompass intelligence include a balance between abilities, including analytical, creative and practical (Sternberg, 2003). Sternberg's use of regression analysis to predict the operationalisation of the theory to future success produced a large effect size that assisted in the construct of the validity of the study (Miller, 2008).

One other domain-specific model was developed by Julian Stanley who established the Study of Mathematically Precocious Youth. This group comprise mathematically or verbally gifted adults who were initially identified as adolescents through a national Talent Search and re-tested on above-level testing (Stanley, 2005). These talent searches identify students who score on the 97th percentile or above on in-grade testing then re-test the students using above-level ability tests (Barnett, Albert & Brody, 2005; Brody & Mills, 2005). Stanley stated that the intent of making provision for these high ability students was to "supplement and complement school-based instruction, not supplant, criticize or 'invade' it." (Stanley, 2005, p. 10). Longitudinal research has identified that as young adults, these adolescents have out-performed the general population, with 25% in one cohort holding doctoral degrees, compared to 1% of the remainder of the United States population (Lubinski, Webb, Morelock & Benbow, 2001).

Renzulli's Three-Ringed Conception of Giftedness (2005) focuses on the interaction of three characteristics and provides a solid example of a systems theory of giftedness. This model is structured around three intersecting rings signifying human behaviours, with the intersection denoting giftedness. The behaviours described in the rings are: above average ability, task commitment and creativity. Renzulli (2005) contends that all three behaviours may not immediately be present, but there is the

capacity for these behaviours to develop if students experience environments supportive of the identified behaviours. Renzulli used the Three-Ringed Conception of Giftedness as the basis of his practical model for school-wide enrichment (Renzulli, Reis, & Smith, 1981). This model – the Enrichment Triad – can be used to design school programs to offer enrichment experiences to students (Renzulli et al., 1981).

The development of talent is evident in the Gagné's (2003, 2004, 2005) model, with Gagné, arguing that talent is an outcome of outstanding achievements, and giftedness relates to natural abilities. The Differentiated Model of Giftedness and Talent (DMGT) denotes giftedness as untrained and spontaneously expressed superior natural abilities in at least one ability domain (Gagné, 2004). Over time and through interaction with other catalysts – environmental (e.g. physical, cultural, parents, peers, teachers, mentors) and intrapersonal (e.g. physical, mental, motivational, volition, awareness of self and others) – those gifts are transformed into talents. Gagné (2004) proposes that chance is also a factor in transforming gifts to talents, influencing both environmental and intrapersonal catalysts.

Some theories and models have evident similarities. For example, Tannenbaum's (1986) model bears some similarity to that of Gagné's (2004, 2005) with both models delineating those factors that link gifted potential to talent realisation. Where these models differ is in their use of the word 'giftedness'. Whereas Gagné uses the word 'giftedness' to describe potential, Tannenbaum (1986) uses 'giftedness' to describe performance. Feldhusen's (1998) model represents a fusion of several other developmental models. He proposes that those basic abilities (e.g., those that are domain specific) are partly determined by genetics, whereas more specific abilities are realised through experience (Feldhusen, 1998). This concept aligns with that of Gagné (2005) who describes the metamorphosis from abilities that are the results of genetics to those skills that are the product of developed talent. Gardner's (1999) theory of multiple intelligences – specifically his perception that identification of special abilities in specific domains provides the base for later talent development – bears similarity to Gagné's DMGT (McAlpine, 2004). Both Gardner's (1999) theory and Gagné's (2005) model provide for talent as a later development.

There is a lack of independent validation of explicit theories and models of giftedness. The data gathered to validate Sternberg's (1996) triarchic theory of giftedness were collected by a team that included Sternberg and is one example of a model that has not been independently validated (Miller, 2008). Critics of Gardner state that his theories have not been empirically tested: his intelligences are based on literature that is selected because it supports his theory (Kaufman & Sternberg, 2008). Locating empirical research that has investigated Gagné's DMGT is somewhat challenging as this model is most often appropriated as a working model for schools (Guenther, 2004). This has meant that the model has not attracted a critique that enables it to claim it has been empirically researched.

Criticism – in the form of commentary rather than research – has centred on the omission of personality from the model, and the failing that is perceived evident in equating talent to skills (Dai, 2004; Guenther, 2004). Dai (2004) claims Gagné has omitted emotions from his model, specifically overlooking the impact of personality on giftedness and talent thereby isolating intelligence from personality. However, this could be disputed if one considers giftedness denoted in the DMGT as "spontaneously expressed superior natural abilities in at least one ability domain" (Miller, 2008, p. 109). As Miller suggests, 'spontaneous expression' denotes emotion and in this context, would refute the idea that Gagné has separated intelligence from personality. Guenther (2004) claims Gagné has limited the concept of talent through equating talent with skills, providing the analogy of a talking parrot to illustrate the effect of teaching skills rather than developing talent. Others have criticised the model for having dismissed what they consider to be an essential component: the definition and conceptualisation of asynchrony (Alsop, 2003; Morelock, 1997). Morelock's (1997) critique intimates that Gagné has focussed on characteristics that can be measured, with this stance meaning he has ignored qualitative differences and additional factors that are important in identifying gifted students.

When comparing the two theories, it becomes obvious that both the DMGT and Gardner's theory of multiple intelligences share some common characteristics. These include having a consistent theory-based definition between gifted students and students who are not gifted – and in Gagné's case – talented or not talented, with both to some extent, predicting later performance. Arguably, the real difference between these two theories lies in the presentation. Gagné's theory is translated to a

model that contains a clear, visual representation of the differentiation between giftedness and talent. Given the practical application that is immediately evident and the power that can be derived from the perceived ability to influence gifts and transform them to a talent, it is possible to argue that this is one reason the DMGT has been adapted for use in schools. With Gagné's environmental catalysts including people such as teachers as influences in the developmental process, it is not surprising that this model has received consideration in educational settings, and that it was chosen to provide the theoretical framework for this study.

Definitions and Constructs

> *"There is no one definition of giftedness nor general agreement about terminology"*
> *(Taylor, 2001, p. 10).*

There is no universally accepted definition of giftedness, though there is agreement that gifted individuals have cognitive, creative and affective characteristics that enable them to achieve outstanding performance in one or more areas (Brody & Stanley, 2005; Callahan, 1997; Ministry of Education, 2001; Moltzen, 2004; Reis & Renzulli, 1997; Sternberg, 2003). Giftedness may differ across cultures, a notion that has been investigated across a range of cultures and ethnicities, with particular emphasis on the inequity that may exist in identifying gifted students who are culturally diverse and may or may not be from low income families (Ford, Grantham & Whiting, 2008; Naglieri & Ford, 2005). Bevan-Brown (2004) has identified Mäori notions of giftedness in the form of characteristics specific to Mäori culture. New Zealand researcher Moltzen (2004) refers to the importance of cultural variance in defining giftedness, and advises that the concept of giftedness is sensitive to time, place and social values. This idea aligns with others who concur that different cultures have difference concepts of what it means to be gifted; therefore, it is important to acknowledge the culture that underpins the child's identity (Bevan-Brown, 2004; Sternberg, 2007; Wu, 2005).

McAlpine and Reid (1996) developed an extensive list of characteristics that pertain to gifted and talented students. The list groups the characteristics under five headings: learning, creative thinking, motivational, social leadership, and self-determination characteristics (McAlpine & Reid, 1996). Van Tassel-Baska (1997) also discusses the importance of considering characteristics of the gifted learner, and

cites just three characteristics that she considers essential in creating an optimal match between learner and curriculum. Those three characteristics are: precocity – with the learner most often demonstrating advanced development in a curriculum area (e.g. mathematical or verbal domains); intensity – which may be evident in the students' ability to concentrate for extended periods, or, in their emotional responses to situations; and, complexity - this being the students' predilection for complex or higher order tasks, with a focus on those tasks being above or beyond their current level (Van Tassel-Baska, 1997).

Defining giftedness and talent would therefore relate not only to time and place, cultural context and social values, but also to natural or acquired behaviours that are influenced by cognitive, creative and affective characteristics leading to outstanding performance. Defining giftedness and talent and using the definition to identity students involves a process that is complex, contextual - and quite often - reliant on testing.

The DMGT

It became clear early in this study that the most appropriate framework with which to examine the concept of high academic achievement resulting from NZQA Scholarship was the DMGT developed by Gagné (2003; 2005). The rationale for selecting this model lay in Gagné's distinction between giftedness and talent, with talent being an outcome of a range of catalysts that were both environmental and intrapersonal. Given the nature of this study and the fact that many of those catalysts described by Gagné (2005) – intrapersonal, developmental and environmental – also emerged in these findings, this model and the underpinning theory provided an appropriate paradigm against which to consider students' perceptions of NZQA Scholarship. After consideration of the critique of this and other models, it is apparent that Gagné's DMGT is well suited to considering high achieving students, and more particularly, high achieving adolescents (McAlpine, 2004; Moon & Dixon, 2006). The DGMT focuses on the importance of individual students, and highlights the significance of context in influencing the transformation of gifts into talents. As Moon and Dixon (2006) have suggested, both individuality and the context in which the student operates, are key considerations for adolescents.

Gagné (2003) includes environmental catalysts that comprise milieu: physical, cultural, social and familial; individual: parents, family, peers, teachers, mentors; and, enrichment; and provision: curriculum, pedagogy, administrative, grouping and acceleration. The intrapersonal catalysts within this model incorporate physical and mental characteristics, awareness of others and, motivation and volition. Each of these catalysts is influenced by chance and by the developmental process where informal and formal learning and practising occurs (Gagné, 2003). As many of these factors – for example, parents, family, peers, teachers – were also indentified by the participants in this study as factors that had influenced their NZQA Scholarship success, it appeared that the components of Gagné's DMGT model bore a resemblance to students' perceptions of their NZQA Scholarship experience. Therefore Gagné's DMGT provided the framework with which to review the literature and the findings of this study that investigated the perceptions of those students who had demonstrated high academic achievement through their success in NZQA Scholarship.

Percentages

The percentage of students who are gifted in any given setting is not clearly defined. Gagné (2003) suggests that the gifts and talents identified in his DMGT place the student in the "…top ten percent of his or her age peers…" in an ability domain. Benbow and Lubinski (1997) concur that those students who achieve the top scores in the above-level testing associated with the Talent Search are amongst America's brightest, in the top one percent or even beyond. Borland (2009) contends that it is a myth to suggest a defined percentage of the population is gifted, and also states that claiming a given percentage of the population is gifted and talented is "logically incoherent" (p. 237). As already discussed, early definitions of giftedness included IQ testing with 'cut-off' scores identifying those who students were deemed to be 'gifted'. Borland (2009) also argues that linking IQ to giftedness is problematic as those scores can be affected by a range of variables, including standard errors of measurement that may preclude students who are a little as one point off the identified cut-off score.

Factors Influencing Achievement

Gagné's DMGT links potential with performance and provides a useful framework on which to examine the plethora of factors attributed to academic achievement in

general, and academic achievement in relation to gifted students (Gross, 2004). The DMGT describes three catalysts that transfer the *natural abilities* (gifts) into *specific skills* (talents). These catalysts are: *Intrapersonal*, *Environmental*, and *Chance*. Deeper consideration of each of these catalysts reveals a range of factors that align with the Ministry's statement describing talented individuals having cognitive creative and affective characteristics that enable them to achieve outstanding performance in one or more areas (Ministry of Education, 2002).

Intrapersonal

Gagné's (2003) description of intrapersonal catalysts includes physical, motivational, volition, self-management and personality catalysts that impact positively or negatively on the development of informal and formal learning and practising. Gagné proposes that motivation plays "a significant role in initiating the process of talent development, guiding it, and sustaining it through obstacles, boredom, and occasional failure" (Gagné, 2003, p. 64). Earlier work by Weiner (1972, 1974, 1985) identified four characteristics that can be attributed as responsible for success or failure in relation to achievement by the learner. This theory, dubbed 'Attribution Theory,' is a cognitive model for understanding human motivation influenced by the individual's perceived control over their success or failure (Weiner, 1972, 1985). Weiner's causal cognitions of ability, effort, task difficulty (persistence) and luck can be investigated alongside Gagné's DMGT model and used to develop a framework with which to investigate the factors which have influenced student success in Scholarship. The first three cognitions – ability, effort and task commitment – will be considered under the heading Intrapersonal. Luck or Chance is considered as a separate heading.

Attributions of success and failure: Ability

The relationship between adolescent achievement based on beliefs and self perceptions suggests that adolescent perceptions of ability relate more strongly to attainment value and intrinsic interest in the task than to its perceived utility value (Eccles & Wigfield, 1995). This finding aligns with the New Zealand research that identified students' motives for choosing subjects directly relating to their achievement (Meyer, McClure, Walkey, McKenzie & Weir, 2006; Meyer, McClure, Walkey, Weir & McKenzie, 2009). This research found that the utility and interest motives of students related positively to their academic results.

A Finnish study of highly mathematically gifted students found that these students perceived that their ability was the reason they achieved success or failure (Nokelainen, Tirri & Merenti-Välimäki, 2007). This research identified that students' reason for this preference related to their belief that their mathematical ability was so high that they could adjust their efforts in order to achieve success. Studies of gifted students' attributions about academic success and failure have identified that the relationship between ability and effort was integral to outcome (Assouline, Colangelo, Ihrig & Forstadt, 2006; Franken, 1987; Good & Brophy, 1986).

There is a suggestion that gender has a role in determining attribution. Boys are more likely to attribute their failure to a lack of ability and their success to luck or effort (Reis, 1998; Rimm, 1999). Gifted adolescent females have been found to believe their ability in reading and language is higher than that of males, and conversely, males perceive their ability in mathematics, science, and social studies is higher than females (Siegle & Reis, 1994). The role of gender in giftedness will be discussed in greater depth, further on in this review.

Attributions of success and failure: Effort

Many studies into the choices academically gifted students make that lead them to success or failure have built upon the aforementioned work of Weiner (Assouline et al., 2006; Pintrich & Schunk, 2002). One such study included the effect of the additional dimensions of teacher bias, student mood, health and fatigue on students' effort, reporting that these factors were integral to student success or failure (Pintrich & Schunk, 2002).

Students believing they have not worked hard enough, rather than believing that they did not have the academic ability to succeed, is an identified attribution of failure (Assouline et al., 2006). This aligns with other studies that suggest gifted students are more likely to attribute success and failure to the effort they expended on the task (Alexander & Schnick, 2008; Chan, 1996).

Meyer et al. (2006) identified a link between student effort and attainment in New Zealand's educational qualification for secondary students. These researchers found that students with a *Doing My Best* motivation orientation to the National Certificate

in Educational Achievement (NCEA) were likely to be the students achieving at the highest level. Conversely, the same research found students who reported *Doing Just Enough* in meeting goals were gaining fewer (NCEA) credits. These findings are consistent with those of DeBacker and Crowson (2006) whose study of 259 students found that those students who preferred predictability related negatively to meaningful engagement. This research mirrored another finding of the NCEA motivation research in identifying that meaningful cognitive engagement related positively to mastery goals (Meyer et al., 2006). The findings of one international study suggest that those students with multiple goals attributed their success more to effort and attained higher achievement (Valle et al., 2003).

Attributions of success and failure: Task commitment

Task commitment is yet another component of the interpersonal catalyst suggested by Gagné (2003) and one that Renzulli and Reis (1997) describe as an essential component in identifying gifted and talented students. They theorise that task commitment is evident as a capacity for high levels of interest and enthusiasm, hard work and determination in a particular area, self-confidence and drive to achieve, an ability to identify significant problems within an area of study, and setting high standards for one's work. Renzulli (2002) writes that task commitment (and creativity) is evident only when the students are given a situation in which they are interested, therefore making task commitment a function of contextual situations. Renzulli uses the words *perseverance, endurance, hard work, practice* and, *the confidence in one's ability to engage in important work* as key terms associated with task commitment. These findings support earlier research which identified that talented high achieving students have (amongst other factors) personality traits conducive to concentrating (Csikszentmihalyi et al., 1993).

Student motivation

Motivation of gifted students is described as 'high academic intrinsic motivation' (Gottfried, Gottfried, Cook & Morris, 2005). These researchers further describe this state as "motivation in the extreme" (Gottfried et al., 2005, p. 172). Alexander and Schnick (2008) link the motivation of gifted students to contexts that are either supportive or non-supportive. They suggest that gifted motivation is extremely complex. Central to the model they propose are personal factors that affect motivation. They describe these factors as: individual aptitude, temperament, and

personality traits including individual responses to feedback, "… classroom activities and, learning situations" (p. 425). These researchers also believe that socio-cultural factors influence and affect classroom context and past motivational history of the gifted student. Those factors combine to influence the development of the students' self-beliefs and theories.

Students' perceived level of competence forms the basis of their self-beliefs and these influence their motivation and behaviour (Alexander & Schnick, 2008). Students' views of self-belief can influence their ability: where they have the view that ability is incremental, they consider ability to be unstable and able to change. Conversely, where they view ability as an entity it is therefore stable and unable to be changed (Dweck, 2002). Self-belief therefore, can also affect student engagement and effort (Alexander & Schnick, 2008).

Students gain self-concept through comparisons they make between themselves and others, who include teachers, parents, peers, friends (Rawlinson, 2004; Ryan & Patrick, 2001; Wentzel, 2005).

Self-regulated learning

Students who exhibit self-regulatory and motivational patterns while engaged in academic tasks are more likely to achieve high levels of academic success than students who do not exhibit these behaviours (Bembenutty, 2007).

Another study identified three categories of self-regulation in gifted students: personal, behavioural, and environmental (Reis, 2004). Reis found that an absence of self-regulation strategies in high potential students can lead to negative experiences for these students. Reis (2004) links delay in gratification to self regulation; she describes how students develop self regulation through deferring one task in order to work harder at another, before rewarding oneself for this effort. Furthermore, Ruban and Reis, (2006) found that high-ability students were more likely to use complex, deep feature strategies in their learning, thus enabling them to process material at a deeper level.

Gifted students and resilience

Much has been written about the influence of factors that build resilience in learners, and a range of descriptions have been used to describe resilience. One explanation

suggests that resilience is the term used to describe survival and the ability to thrive when faced with adversity that would usually be predictive of negative outcomes (Osofsky & Thompson, 2000). Although the literature pertaining to resilience and giftedness is small, it has an important role in identifying those factors that enable students to thrive and survive in conditions that are less than ideal. In a review of the literature pertaining to resilience and coping and the implications for gifted youth, four key factors were identified (Kitano & Lewis, 2005). Those factors are: compensatory, risk, protective and vulnerability factors. This review also found that low-income and culturally diverse children and youth have more experience in overcoming diversity and they may also possess greater ranges of flexibility in coping with others.

A three year research study involving 35 "economically disadvantaged, ethnically diverse, academically talented high school students" further identified the risk and protective factors that had either facilitated achievement or hindered it (Reis, Colbert, & Hébert, 2005, p. 110). Those protective factors included: supportive adults, friendships with other achieving students, opportunities to have advanced classes, the development of a strong belief in self, ways to cope with the negative aspects of their school and (urban) environment and/or family lives, and their previous association with a gifted and talented programme (Reis et al., 2005). Participation in multiple extracurricular activities was also identified as a protective factor and, important in establishing a positive relationship between achievement and participation (Eccles, Barber, Stone & Hunt 2003; Guest & Schneider, 2003; Reis et al., 2005). Potential risk factors were identified as including older siblings who had dropped out of school who were involved in drugs or alcohol (Reis et al., 2005). These siblings of the identified economically disadvantaged, ethnically diverse, academically talented high school students were found to demonstrate few protective factors. Reis et al. concluded that one "necessary protective factor was the presence of at least one supportive adult for achievement to occur and resilience to develop" (2005, p. 119). Although not specifically pertaining to gifted students, a review of literature on the fostering of educational resilience identified that the "…teacher …possess[es] the tools to introduce at-risk students of all ages to the life changing experience of educational resilience" (Downy, 2008, p. 64). In a recent study that investigated how family, school and social backgrounds contribute to highly gifted students' self-identify, self-concept and self-esteem, the importance of having

someone significant to care about them or respect them was also identified as a significant positive factor in those gifted students who eventually self-actualized (Ruf, 2009).

Literature relating to the role of poverty in high achievement identified the importance of developing resilience in low-income, high-ability students (Burney & Beilke, 2008). This study also recommended the need for individual support and improvised identification practices for those students who are high-ability learners affected by poverty.

The influence of gender

There is research to suggest that gender may play an important role in high academic achievement (Reis, 1998; Rimm, 1999; Siegle & Reis, 1994). Research from the United States suggests that gifted programmes there serve proportionately more girls than boys, yet boys achieve at higher levels than girls on some standardised tests (Kitano, 2008). Much of the recent research highlights conflict in findings: gifted female students in America are perceived to have similar levels of self efficacy in mathematics to males (Dai, 2002). Conversely, there are evident differences in the ratio of female achievement levels of attainment in mathematics compared with males (Spelke, 2005).

Barriers, including peer pressure, stereotyping and low expectations, have been identified as reasons responsible for turning gifted females away from Mathematics (Castelvecchi, 2008). Arguably, New Zealand data suggest otherwise. The NZQA site reveals that in 2007, three of the Top (Premier) Scholars in NZQA Scholarship were females, five were males. Of the 27 Top Subject Scholars, 11 were male and 16 were female, with females taking prizes for both mathematics with calculus and mathematics with statistics, and males taking prizes for each of the science subjects: biology, chemistry, science and physics. It is possible to view learning area results on the NZQA site by gender and ethnicity. To do this and select external standards in English reveals that in 2007 at Level 3 NCEA the percentage of all students gaining 'Excellence' was 5.1%. The percentage of female students gaining 'Excellence' was 6.5% compared with 4.4% of males. In mathematics this trend was reversed, with the percentage of all students gaining 'Excellence' being 5.4%, males at 5.8% and females at 5.0%. At this level overall, females gained more external 'Excellence'

standards than males in language and languages; English; science; technology; social sciences; the arts; and health and physical education. Males gained more external Level 3 standards than females in only Māori and mathematics.

It has been suggested that New Zealand's gifted girls are a special population in need of empowering through role modelling and the provision of educational opportunities (Macleod, 2004). However, it would seem that this suggestion may be unnecessary in many New Zealand contexts. In recent years New Zealand has had a number of women hold high public office, including Governor General, Attorney General, Prime Minister and Leader of the Opposition Party. It was this reality that led the researcher to conduct a study with a class of Year 5 New Zealand females, to ascertain their beliefs and attitudes *towards* high achieving females, to determine the beliefs *of* New Zealand high achieving females, and to facilitate student research *into* high achieving New Zealand females (Horsley, 2001). Findings from this study identified that the parents of these students and the high achieving females who participated in the study were in agreement that girls could achieve the same high academic success as boys. A key finding from this study was that:

> …it appears that many of the perceived barriers to the achievement of gifted and talented females (parents, peers and teachers) identified by overseas researchers actually serve to facilitate and enhance the learning of gifted females in New Zealand. (Horsley, 2001, Conclusion section, para. 2)

Overseas research proposes that gifted males who excel in sport are susceptible to additional pressure that comes from wanting to prove their masculinity (Kerr & Cohn, 2001). These authors state that intent on losing their perceived 'nerd' image, some males are choosing to select their sport over their academic work. The additional pressure these students experience from teachers, coaches and family means these students are required to deal with high expectations from multiple quarters (Hébert, 1998). Hébert (1991) further suggests that gifted males carry the additional burden of needing to compete thus placing additional pressure on themselves.

One other study pertaining to gender and parents – although not specially related to gifted students – identified that mothers had higher levels of acceptance of their adolescents, and greater knowledge of their daily activities than their fathers did (Updegraff, Delgado & Wheeler, 2009). The parents in this study were immigrants with levels of education and income levels ranging from poverty to 'upper class'.

The study found that mothers reported spending more time with adolescents than fathers, there was no significant difference in family incomes, parents' education levels or fathers' work hours (Updegraff et al., 2009).

It would seem that literature pertaining to academic giftedness and gender has found that there are barriers for both males and females created by self and society that can impact on their success, suggesting that gender can be perceived as both an intrapersonal and an environmental factor in the success of talented students.

Environmental

Teacher expectations, parents and the impacts of peers are all factors Gagné (2003) includes as environmental catalysts.

The teacher

It appears that research that attempts to determine those qualities of effective teachers of the gifted has wrestled with the delineation of teacher characteristics that relate to personality, and teacher characteristics that relate to professional or pedagogical qualities. Although literature pertaining to characteristics of effective teachers is gaining in size, determining what defines personality traits and what comprises professional qualities is difficult to establish. However, what is clear is that there are specific qualities which have been found to facilitate learning amongst gifted students (Chan, 2001; Feldhusen; 1997; Kanevsky & Keighley, 2003; Mills, 2003; Riley, 2000; Robinson, 2008; Vialle & Quigley, 2002; Vialle & Tischler, 2005).

Robinson (2008) claims that the literature in gifted education has focussed on describing and documenting teacher characteristics "…identified by students, supervisors, and experts in gifted education as desirable for high-ability learners…" rather than establishing links between teacher characteristics and student achievement in schools (p. 671). Robinson (2008) describes recurring characteristics from the literature on teacher characteristics including: intellectualism, subject matter expertise, a personal rapport with high-ability learners, and enjoyment teaching them. Australian research synthesising the literature on the qualities of effective teachers of the gifted has grouped teacher characteristics under the following dimensions: teachers' knowledge and skills; teaching and classroom management style; and interpersonal qualities (Vialle & Quigley, 2002). These researchers found that Year 7 gifted Australian students indicated

a preference for teachers personal-social qualities over their intellectual qualities, with this preference shifting with Year 11 gifted Australian students (the New Zealand equivalent of Year 12) favouring teachers' intellectual qualities over their personal qualities (Vialle & Quigley, 2002). This perspective was considered further in a project that included gifted students from Australia, Austria, and the United States (Vialle & Tischler, 2005). The findings in this study concluded that gifted students appreciated teachers have both favourable personal qualities and intellectual skills in addition to demonstrating a range of pedagogical approaches (Vialle & Tischler, 2005).

Qualities of effective teachers of the gifted are also discussed by Feldhusen (1997) who describes six desirable teacher characteristics that include being highly intelligent, having cultural and intellectual interests, striving for excellence or high achievement, being enthusiastic about talent, relating well to talented people and having a broad general knowledge. Feldhusen (1997) also suggests that these teacher characteristics often match those found in talented youth.

In the 2007 Scholarship Pilot Study for this study, the majority of students who participated stated that they valued and appreciated the support they received from those teachers in whose subjects they were successful in gaining Scholarship (Horsley, 2008a). These findings were supported by earlier New Zealand and international research and literature (Feldhusen, 1997; Riley, 2000; Riley et al., 2004; Vialle & Quigley, 2002; Vialle & Tischler, 2005). The students in the Pilot Study identified 10 characteristics of effective Scholarship teachers, including enthusiasm and passion for their subject, treating students as adults, valuing opinions, taking a personal interest, creating a classroom climate conducive to learning, demonstrating an understanding of pedagogical knowledge, linking learning to the real world, showing commitment, having strong subject knowledge and providing feedback that promoted learning (Horsley, 2008a).

A study of 63 teachers and more than 1,000 'highly able' students found that teacher personality types were similar to the personality types of the gifted students (Mills, 2003). Mills states that these findings suggest "…teacher personality and cognitive style may play a role in his or her effectiveness in teaching gifted students" (p. 272). Furthermore, the research found that these teachers who had a preference for

working with abstract themes and concepts were open and flexible and valued logical analysis and objectivity.

The importance of a teacher of the gifted facilitating learning was identified in a New Zealand report investigating approaches to teaching gifted and talented students. This report included a review of the international literature on the characteristics of effective teachers of gifted and talented students (Riley et al., 2004). Teacher qualities that were identified included enthusiasm, motivation, and teacher confidence. Riley (2000) also cited the importance of moving away from being 'teachers' of the gifted, towards becoming 'facilitators' of learning, sharing control in the classroom.

A caring teacher who develops a relationship with a gifted learner can mitigate unfavourable effects of adverse issues in the student's life (Kanevsky & Keighley, 2003). This study found that gifted students identified teachers who were fair and flexible, and acknowledged their teachers' professional commitment. These researchers suggest that these enthusiastic teachers have qualities that include classroom opportunities to discuss and debate, thus giving students some modicum of control over their learning, in addition to showing caring towards the student. The importance of teachers caring for students is also a key finding from the Te Kotahitanga project. Te Kotahitanga, a collaborative project responding to the underachievement in educational outcomes for Māori students, identified that when Māori students have good relationships with their teachers they flourish at school (Bishop, Berryman, Cavanagh, & Teddy, 2007).

Feedback

Another aspect of teacher efficacy is the provision for support in the form of feedback. There appears to be little that has been written specifically relating to feedback for gifted students. New Zealand researchers Hattie and Timperley (2007) reviewed the international literature to ascertain the components of teacher feedback that were having a major influence on student learning and achievement. This review found that the effect of feedback varied according to the differing level of the feedback. These authors describe four categories of feedback: about the task; the processing of the task; self-regulation; and the self as a person. Hattie and Timperley (2007) also write of the importance of considering the "… nature of the feedback, the timing, and how a student 'receives' this feedback" and of the need for a teacher to

address the three feedback questions: where am I going; how am I going; and, where to next? (p. 101). These New Zealand researchers also discuss the importance of classroom climate when giving corrective feedback and highlight the personal risk that students take in responding publicly or being seen to fail. They suggest that students are most likely to respond to a question when they are sure they are correct, and that in some classroom climates the opportunity to make errors and learn from them is not welcome. One other interesting consideration in the article relates to students' attributions about success or failure, which Hattie and Timperley argue can often have more impact than the reality of that success or failure.

Taylor (2004) suggests that the way in which gifted students receive praise and acknowledgment is important. She suggests that teachers could perceive that able students who consistently achieve at a high level do not need extrinsic rewards for their efforts. Ziegler (2005) contradicts what others believe in relation to feedback for talented students. He contends that the learner must be able to recognise when they have reached the level of excellence, that the continual need to have that state affirmed by others means the student will not only fail to recognise excellence in themselves but they will probably never attain that level.

Family

One study identified that it was a combination of factors – the home, the teachers, the schools and society – that impacted on students achieving their full potential (Bloom, 1985). A New Zealand study also identified a home environment in which children were encouraged to engage with ideas and developed a love of books as a common thread in his 'gifted' participants' stories (Moltzen, 2005). Others have reiterated the importance of school, family and community in supporting academically talented students (Tomlinson, Callahan, & Lelli, 1997). This link between environmental factors and talented students is not only consistent with Gagné's DMGT but also with the findings of Csikszentmihalyi et al. (1993). This study of talented teens identified a range of factors influencing success in these students, including the influence of socioeconomic factors that related to the teens' parents. This research found that the students identified as talented youngsters were from families who were "better off financially" (p. 206). Furthermore, this research recognised that the talented teens' families' educational and economic resources were better than was

typical of the community, with the additional evident features of demonstrating flexibility and family cohesion.

In the Pilot Study that preceded this Scholarship project, further links to the importance of environmental factors in the success of high-ability students were identified. Many of those students who had gained Scholarship and were interviewed about the role they perceived their parents had played in their success, felt it was the combined attitude of both parents that had supported their entry into Scholarship and ultimately, their success (Horsley, 2008b). Students also discussed the absence of familial pressure as a positive influence on them. Overall, these students considered their 'mother' to be more influential than their 'father' in their study. Students identified that their mothers made their homes comfortable for study while their fathers often assisted them with content knowledge related to Scholarship.

A further link to the role environmental factors play is found in research that suggests that a family's generational history and stability affects the ways families can influence and support their gifted children (Albert, 1994). Albert suggests that a family's interests, educational knowledge, social skills and financial resources are influenced by what has occurred in previous generations. Other factors said to influence the gifted students' success include the level of a parent's education and the parental attitude towards the gifted student (Bloom, 1985; Olszewski-Kubilius & Yasumoto, 1994). Olszewski-Kubilius and Yasumoto (1994) state that this influence is most evident in relation to course selection.

A study that relates to parenting and ethnicity suggests the influence of parents is most marked amongst Asian students and their parents (Olszewski-Kubilius & Yasumoto, 1994). Wu (2008) investigated parental influence on children's' talent development and found that parents of Chinese students were highly confident about their child's future and talent development. This study suggested that the more the parent was involved in the child's learning, the greater the parent's confidence in the child's future.

Ethnicity

The importance of remembering that giftedness is contextual is evident in a text that considers cultural conceptions of giftedness. For example, rather than grouping all

Asian students together, the editors have separated out 'Asian' ethnicities into Japanese, Central Southern Asia, Chinese, and Thai, thus identifying unique conceptions of giftedness arising from each culture (Phillipson & McCann, 2007).

A New Zealand study examined teacher expectations in relation to student outcomes (Rubie-Davies, Hattie, & Hamilton, 2006). The researchers discussed two effects of teacher expectations: whether to sustain expectation effects or to create self-fulfilling prophecies. This New Zealand research found that teachers "…generally had high expectations for all ethnic groups other than Maori..." (Rubie-Davies et al., 2006, p. 437). The research further investigated the difference between teachers' judgements and the students' actual achievement for each ethnic group in the study, concluding that ethnicity may be a factor in establishing teachers' expectations. This study discussed the effects of teacher expectation on self-fulfilling prophecy in relation to student achievement, describing the 'Galatea effect' as the positive effect of high teacher expectations on academic achievement and highlighting the important role the teacher has in student academic achievement. Another study found that the messages sent to students about stereotypical expectations relating to ethnicity or gender could create doubt and anxiety in students, resulting in lower test performances (Steele, 1997).

Research gaining in momentum, both in New Zealand and overseas, describes the importance of classroom practitioners establishing culturally inclusive classrooms that, in turn, lead to improved academic outcomes for students (Bishop & Glynn, 1999; MacFarlane, 2004; Pierce, Adams, Speirs Neumeister, Cassady, & Dixon, 2007). International research demonstrates that students from low income families and students who may be culturally diverse are often under-represented in programmes that cater to the needs of gifted and talented (Ford, Grantham & Whiting, 2008; Naglieri & Ford, 2005; Pierce et al., 2007). Although there is a plethora of writing that discusses the inequitable representation of gifted and talented culturally diverse students in the United States of America (Bernal, 2002; Ford et al., 2008; Pierce et al., 2007), New Zealand literature is scarce. The report investigating approaches to teaching gifted and talented students in New Zealand included a review of the literature identifying the barriers to proportional representation of culturally diverse students in gifted education (Riley et al., 2004). While the report suggests that most evidence reporting Māori students as under-represented in gifted education is anecdotal, it also states that "empirical evidence of under-representation

is sparse" (p. 133). However, one other report suggests that part of the reason for this under-representation could well be related to socioeconomic status rather than ethnicity (Keen, 2004). A similar finding was reported in an English study that identified ethnicity and socio-economic status were factors that influenced participation in gifted programmes (Campbell et al., 2007). This study identified that "… the gifted and talented … tend to come from the middle and higher strata of society, with the highest strata being particularly strongly represented, while the lowest strata are particularly strongly underrepresented" (Campbell et al., 2007, p. 111). Furthermore, this study identified significant overrepresentation of Chinese and mixed ethnicity (e.g. White-Asian) students in these gifted programmes, and under-representation of what the project describes as Black Students (Campbell et al., 2007). In his New Zealand study Keen (2001) identified that the parents of a large number of Māori children were unskilled labourers or beneficiaries, further suggesting that socio-economic status coupled with ethnicity could be contributors to the under-representation of these students in gifted and talented programmes.

Findings from the Te Kotahitanga project suggest that deficit theorising by teachers is a major impediment to Māori students' educational achievement (Bishop et al., 2007). During Stage 1 of this project, researchers elicited Māori students' perceptions of the ways they felt their education could be improved (Bishop, Berryman, Tiakiwai, & Richardson, 2003). Subsequent teacher professional development was based on student responses and those provided by the students' caregivers or parents, and through a review of appropriate literature. The professional development for teachers was designed to improve learning, behaviour and attendance outcomes for Māori students and centred on improved teacher–student relationships.

International research has also shown that underrepresented culturally diverse and economically disadvantaged students can excel when they are given the right programme and resources (Pierce et al., 2007; Watt, Powell, & Mendiola, 2004). American studies have found that there are strategies that these students can be taught to assist them in improving their test scores and, ultimately, qualify them for gifted and talented programmes and university (American college) entrance (Lohrfink, 2006; Lynch & Mills, 1993; Mills, Stork, & Krug, 1992). This literature addresses both economically disadvantaged students and students who are culturally diverse (Bernal, 2002, Pierce et al., 2007).

New Zealand literature pertaining to ethnicity and achievement is sparse. However, the statistics on the NZQA database provide aggregated student results using a number of variables including ethnicity (NZQA, 2007). Selecting external Level 3+ standards in English reveals that in 2007 the percentage of all students gaining 'Excellence' was 5.7%. The percentage of Māori and Pasifika students gaining 'Excellence' was less than 5.7% (2.8% and 2.6%). The percentage of New Zealand European students gaining 'Excellence' was 6.0% and the percentage of Asian students was 7.8%. In mathematics the overall percentage of students gaining 'Excellence' was 5.4%, with New Zealand Europeans gaining 5.0%; Māori 1.7%; Pasifika 1.5% and Asian students gaining 7.7%. This pattern is also evident for a number of subjects, including the arts, technology, social sciences and science.

Friends and peers

Schunk (1987) suggests that gifted learners work best beside students who have similar ability to themselves. The idea of working with like-minded gifted peers has been the focus of many studies of gifted students, as are the ways in which these students can collaborate (Colangelo, Assouline, & Gross, 2004; Eckstein, 2009; Gross, 1994; Rogers, 2004). Eckstein (2009) states that "opportunities for gifted students to collaborate with other gifted students in areas of interest are important to keeping gifted students engaged in schools" (p. 59).

A New Zealand study found that although some students preferred to work alone, they loved "…the cut and thrust and stimulus of discussion with like-minded peers" (Keen, 2004, p. 273). Keen suggests that gifted students in New Zealand have experienced frustration working with peers who do not share their work ethos. Aside from grouping influences, peer relationships are important in the development of gifted students (Peterson & Moon, 2008). In his study of underachieving males, Hébert (2001) identified that negative peer group influences can lead to gifted males underachieving, and failing to develop appropriate strategies for dealing with challenge in their lives. Similarly, research has identified that gifted girls may choose to hide the fact that they are gifted in order to 'fit in' with a social group (Callahan, Cunningham, & Plucker, 1994; Kramer, 1991).

The mentor

Research describes mentoring programmes as successful if they have established close, lasting connections that have promoted positive developmental change (Rhodes & DuBois, 2008). These researchers reiterate the importance of the relationship being based on time spent together over a significant period of time, where there is a "strong connection that is characterized by mutuality, trust, and empathy" (p. 255). When these described conditions occur, the researchers contend the youth in a mentored relationship will derive significant benefits.

In the gifted literature, there are several definitions of a mentor. One definition describes a mentor of the gifted as a teacher who models learning skills on a daily basis encouraging students to be lifelong learners (Bisland, 2001). Silverman (1993) describes a mentor of gifted students as someone who guides and advises students while providing friendship as they work together to improve the student's content knowledge. There is a paucity of literature describing the training or initiation of mentor roles in gifted literature. There is, however, no shortage of literature promoting mentor relationships for gifted students and describing the important place that role modelling can have in a mentor-mentee relationship, especially those established with students from low socio-economic backgrounds (Speirs Neumeister & Rinker, 2006). Mentoring for gifted youth is purported to have multiple benefits that include benefits to their cognitive and affective development (Callahan & Dickson, 2008). In an article that discusses the benefits of gifted student artists working with art teachers, the writers suggest that artist-teachers are able to serve as role models and mentors to the students, helping them to fulfil their creative and educational potential by providing encouragement (Chin & Harrington, 2009). Although this article does not mention formal mentor training for teachers, it does suggest that the teachers in this programme spend time getting to know their students well. The article continues by encouraging others who have experience in a specialised field to volunteer to mentor gifted students. This aligns with the findings of Rhodes and DuBois (2008), who encourage mentors to:

a. have previous experience of mentoring
b. commit to at least twelve months in a mentoring programme
c. ensure they (mentors) receive appropriate training
d. monitor and evaluate the mentor programme.

The New Zealand Ministry of Education (2000) suggests that a mentoring approach is particularly appropriate for Māori learners, and recommend that the person chosen to be the mentor is also Māori. Bevan-Brown (2004) also recommends the development of strong support networks to encourage students with special abilities, and describes the role family can play in using their expertise to provide a mentoring relationship with gifted Māori students. An attempt to retain African-American males in gifted programmes identified a number of reasons that this was proving challenging (Grantham, 2004). Central to the problem was the undermining of these students' confidence and motivation to achieve. The author concluded that one response could be to establish mentoring relationships that engage African-American males in positive experiences, leading to improved educational outcomes. Importantly, Grantham (2004) cites the significance of the mentor providing a positive role model for this group of students.

The school

Since Term 1 2006, it has been mandatory for all New Zealand state and state integrated schools:

> … to demonstrate how they are meeting the needs of their gifted and talented learners, as they are currently required to do for students who are not achieving, who are at risk of not achieving, and who have special needs. (Ministry of Education, 2009, para. 1)

It would appear that the effect of this National Administration Guideline (NAG) in schools has yet to be researched. However, a recently released report from the Education Review Office (ERO) (2008) evaluated the provisions for gifted and talented students in 315 schools, including 261 primary schools and 54 secondary schools. This study identified that in over half of the schools, the leadership teams supported the achievement of gifted and talented students. Schools were at various stages of development of their gifted practice: some had developed and implemented programmes, and a few were just beginning to make special provisions. This report identified that "nearly half the schools promoted positive outcomes for identified gifted and talented students" (Education Review Office, 2008, p. 1).

Perhaps most relevant to this NZQA Scholarship study is the New Zealand literature review of planned approaches to gifted education. In this work Riley et al. (2004) found that less than half of the schools responding to their survey reported school-based concepts or definitions for their gifted and talented students. Moreover, they

found a relationship between school types, deciles[1] and localities that impacted on whether the school had a definition. This review suggested that the higher decile schools (described in their study as deciles six to ten) were more likely to report a school-based concept or definition of giftedness.

Appropriate learning opportunities

The improved academic outcomes that are evident when students receive educational opportunities based on their ability and not their age have been well documented (Csikszentmihalyi et al., 1993; Sullivan & Rebhorn, 2002). Benefits have been identified when students are accelerated within subject areas – and this applies not only to gifted and talented learners (Phillips, 2008). Early entrance to university has been found to have positive effects on gifted students. Students cited their reasons for choosing early entrance, including their excitement about learning, the need for intellectual stimulation, and the opportunity to work with groups of like-minded peers (Noble et al., 2007).

One form of acceleration is found in the process of dual enrolment. In the United States this process enables gifted students to attend high school while simultaneously being enrolled in an American college (the equivalent of a New Zealand university) and has been found to promote improved academic outcomes for this group of students (Davidson & Davidson, 2004). This idea of improved academic outcomes is further promoted in the review of literature pertaining to American college (university) programmes for gifted and talented students (Rinn, 2007). Rinn suggests that some early entrance programmes enable gifted students to omit all or part of their high school years, thus entering university at an earlier age than would usually be expected. The entrance requirements for places in these programmes are usually based on standardised test scores, essays, letters of recommendation, and, sometimes, through interview (Olszewski-Kubilius, 1995).

As the New Zealand review made evident, there is still variation within New Zealand schools relating to, firstly, the identification of gifted and talented students and, secondly, the consistency of appropriate programmes and special classes for these

[1] Decile rankings of New Zealand students' schools range from one to ten. In New Zealand, census information is used to determine a school's decile ranking. The ranking is an indication of the extent to which the school draws its students from low socio-economic communities and the government funds proportionately (i.e. low decile = higher funding).

students (Riley et al., 2004). American research on students participating in a university honours programme found that those students who had previously participated in a gifted programme as a child or adolescent were more likely to have higher grade point averages than those students who had not been a part of a special programme (Rinn, 2007).

Acceleration

Longitudinal research on highly gifted students has identified the importance of early acceleration and curriculum compacting, a process whereby curriculum is condensed to enable the student to progress more quickly through the grades (Sullivan & Rebhorn, 2002). This is especially true for highly gifted students. Highly gifted students are defined as "…those who score three or more standard deviations above the mean on a test of cognitive ability… with an IQ score of 145 or greater whether the standard deviation of the test is 15 or 16" (Gross, 2008, p. 241). Gross further describes two subsets within this group: those who are exceptionally gifted with an IQ score of 160 – 179 and those who are profoundly gifted, with an IQ score of 180+. Gross's longitudinal research on 60 accelerated Australian students, each with an IQ score of 160+, identified 17 students who had received 'radical' acceleration. Gross states that none of the students had regrets about having been accelerated, and the majority of the group had entered college between the ages of 11 and 15. She further claims that almost all of the group continued with their education and have obtained doctoral degrees (Gross, 2008).

A 10 year American study of 320 profoundly gifted students found that 95% of the students had been accelerated in high school and those who expressed dissatisfaction with acceleration did so because they had wished to be accelerated further (Lubinski, Webb, Morelock & Benbow, 2001). As with Gross's study, this group were also identified as gaining doctoral degrees at rates the authors claim were over 50 times the base rate expectation.

Chance

Skill and luck

Weiner's (1972) description of 'luck' as a motivational characteristic aligns with Gagné's (2003) inclusion of '*Chance*' as a catalyst in the transfer of natural ability into specific skill. Weiner (1972) suggests that chance rather than skill or

environment, differentially affect behaviour, Leading on from this supposition, Weiner suggests that there is a difference in individuals' perceptions of outcomes achieved through chance, as opposed to outcomes achieved through skill. Weiner further theorised that the individual difference would be "a determinant of generalized expectances, and thus influence the subjective probability of goal attainment and subsequent behaviour" (Weiner, 1972, p. 338).

NZQA Scholarship

In 2002, the new standards based assessment NCEA level 1 was introduced to replace the former School Certificate. In 2003 Level 2 was introduced and in 2004 the former University Bursaries examination was replaced by NCEA Level 3. Students attained grades of 'not achieved', 'achieved', 'achieved with merit' or 'achieved with excellence' for different achievement standards (or achieved versus not achieved for most unit standards that are not typically available with merit or excellence). NCEA is described in government documents as "…New Zealand's main national qualification for high school students…" In 2005, acting on advice received from the SRG, the government introduced the re-designed Scholarship Awards for distribution to what they claimed would be approximately 3 per cent of students studying at Level 3. The reference group claimed that they:

> …sought to maximise the validity of the Scholarship examinations. In this context, validity means fairly identifying students who are displaying excellence in their academic work at the end of secondary schooling, but it also means sending appropriate signals to students that help motivate as many as possible to strive to develop and display such excellence. (Ministry of Education, 2005)

The process for calculating the number of students who could be awarded a Scholarship in each year is described in a communication from the Team Leader of the National Assessment Facilitator of the Secondary Examination Qualifications Division, NZQA:

> The 2005 SRG report into Scholarship made a number of recommendations. One of these related to the awards going to a portion (3%) of the level 3 cohort studying the subject. To identify the cohort we require information in December to determine this for each subject. To determine the cohort we identify candidates who have: a total of 14 or more credits from level 3 internal results and/or external entries. Note that it is external entries and not results or achievement that is required. The purpose of identifying entries/results in at least 14 credits is to identify the cohort of students who are undertaking study in that subject. (R. Emery, personal communication, February 27, 2008)

In 2007 NZQA introduced details of excellence and merit endorsements for NCEA certificates. The purpose of these is to encourage students to achieve high quality work, and to recognise where high achievement occurred (NZQA, 2007). Students need to accrue at least 50 NCEA credits with 'Merit' (that may include some 'Excellence' credits) to gain an endorsement with 'Merit', or at least 50 credits with 'Excellence' to gain an endorsement with 'Excellence'.

To summarise, it appears that research has identified a range of factors that influence the development and realisation of giftedness and talent in teens. Amongst other things, these factors include the influence of, and relationship with, others including family members, the teacher and peers or friends; the family's socio economic status; the enriched/accelerate opportunities the students may have access to, and the students' motivation orientations.

Research Questions

The following questions derived from literature pertaining to giftedness and NZQA Scholarship have provided the foundation for this study:

1. To what factors do students attribute their success in attaining Scholarship?
2. What patterns can be identified in student backgrounds and school experiences relating to attaining Scholarship?
3. What were the Year 11, 12 and 13 academic performance pathways and achievement patterns reported by the 2006/2007 Scholarship recipients?
4. To what extent did the students' valuing of Scholarship influence their success?

The next chapter will describe the methodology used in this study and explain the rationale for using the chosen methods and tools to investigate these factors.

CHAPTER 3
Methodology and Methods

This purpose of this chapter is to provide an overview of methodology and research methods through which the data are generated and gathered, prior to analysis and interpretation. Before commencing any description of the processes employed in research it is important to define the terminology that is to be used (Creswell, 2009). *Methodology* refers to the philosophical framework that relates to the entire process of research. The *methods* are the specific techniques used for data collection and analysis. For example, in quantitative data this may involve using specific tools or instruments, whereas in qualitative data this may relate to analysing themes (Creswell & Plano Clark, 2007).

Methodology: Philosophical Paradigm

A philosophical framework – or researcher's worldview – serves to inform the reader of the researcher's philosophical assumptions that are underpinned by their personal experiences, culture and their history (Creswell & Plano Clark, 2007). It is important that these assumptions are laid open as they inform the "…assumptions the researcher makes about reality, how knowledge is obtained, and the methods of gaining knowledge" (Creswell & Plano Clark, 2007, p. 21). In research that uses grounded theory, it is usual to find the researcher identifying with a social constructivist worldview (Charmaz, 2007). A constructivist worldview has four major elements:

1. Understanding;
2. Multiple participant meanings;
3. Social and historical construction; and
4. Theory generation. (Creswell, 2009, p. 6)

Charmaz (2007) suggests that in grounded theory that uses a constructivist approach both the researcher and the participants interpret meanings and actions. Charmaz (2007) describes the close relationship that develops between the researcher and the participants. This differs from a pragmatic paradigm or worldview in that the four key elements of the pragmatic paradigm are:

1. Consequences of actions;
2. Problem-centred;

3. Pluralistic; and
4. Real-work practice orientated (Creswell, 2009, p. 6).

Researchers with a pragmatic worldview focus on using all resources available to them to assist in gaining understanding of a problem. Often this will involve the use of both qualitative and quantitative data (Tashakkori & Teddlie, 1998). Plano Clark and Creswell discuss the Pragmatic paradigm when defining mixed methodology studies (those employing both qualitative and quantitative data) as "studies that are the product of the pragmatist paradigm and that combine the qualitative and quantitative approaches within different phases of the research process" (2008, p. 22).

Methods

Mixed methods research

Mixed methods research – a relatively new approach to research - has been defined as "research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using program of inquiry" (Tashakkori & Creswell, 2007, p. 4). Previous descriptions of this type of research referred to either qualitative and quantitative procedures, multimethod or multimethodology (Plano Clark & Cresswell, 2008; Tashakkori & Teddlie, 2003). There are some who even suggest that a 'war' raged in the social sciences, with researchers arguing the superiority of one or the other of the two major social science paradigms: the positivist/empiricist approach or the constructivist/phenomenological orientation (Guba & Lincoln, 1994; Plano Clark & Cresswell, 2008). The underlying tension of the argument arose from the methods that underpin each of these paradigms: the positivist paradigm is informed by quantitative methods and the constructivist paradigm is informed by qualitative methods (Guba & Lincoln, 1994). Arising from these so called 'wars' was the mixed methods approach, a third paradigm for social research that employs both qualitative and quantitative data, using one to complement the other (Denscombe, 2008). Mixed methods research therefore is designed to utilise the strengths of two approaches to research – that of gathering and analysing both qualitative and quantitative data – by combining them in one study (Plano Clark & Creswell, 2008).

The mixed methods approach to research provides a number of challenges for the researcher. These include the need to analyse both qualitative and quantitative sets of data and for the researcher to be familiar with qualitative and quantitative research (Creswell, 2009). A concurrent embedded strategy of mixed methods uses one primary method of data collection that guides the project and a secondary set of data that provides a supporting role in the data gathering (Creswell, 2009). Hence, one type of data is embedded in the other, and both types of data are collected simultaneously.

Qualitative and quantitative data in gifted studies

Although research using a qualitative paradigm is considered to be a fairly recent addition to gifted education, it is now an accepted mode of inquiry (Coleman, Guo & Simms Dabbs, 2007). Research into giftedness may be either, or both, qualitative and quantitative, with quantitative research used to describe trends and to explain relationships and qualitative research exploring experiences and providing descriptions of stories and situations (Callahan & Moon, 2007). A criterion with which to substantiate results includes the need for qualitative results to:

a. be pertinent;
b. be understood by the participants;
c. be general enough to make sense; and
d. provide participants increased control of their lives within the set context (Glaser & Strauss, 1967).

Callahan and Moon (2007) describe 'keys' requiring consideration in gifted (non-intervention) quantitative research. These include: a description of the participants so readers can discern whether results are applicable to their context, a description of the sampling process, a description of the instruments used, and a description of the type of statistical procedures used to address the research question (Callahan & Moon, 2007). The keys described for qualitative research include: descriptions of the role, background and experience, and philosophical orientation of the researcher; an explanation of the purposeful sampling of study participants and full description of their characteristics and their context; data gathering occurring over time; data that may be collected from a small number of individual or sites but with full description; and, analysis of data to develop description should be credible and verifiable (Callahan & Moon, 2007).

Grounded theory

> …the strongest case for the use of grounded theory is in investigations of relatively uncharted waters…. (Stern, 1995, p. 30)

Dey (2003) explains that the aim of grounded theory is to generate or discover a theory. Creswell (2005) suggests the researcher may choose to use theoretical propositions (or hypotheses) to convey a theory, these being statements that indicate relationships amongst categories. Dey (2003) describes how the emerging theory ought to focus on the ways individuals interact in relation to what is being studied, with the overall focus on behaviour. Furthermore, grounded theory provides tools for analysing processes (Denzin & Lincoln, 2005; Strauss & Corbin, 1994, 1998).

A key feature of grounded theory is the constant analysis and comparison of data that develop theory (Creswell, 2003). This iterative process enables the researcher to develop a systematic process of collecting data, identifying themes or concepts, connecting these themes and developing a theory that explains the process (Creswell, 2005). This process is continued until data saturation is reached (Creswell, 2008). The theories that emerge from the data gathered are intended to generate rather than validate a data-based theory (Schraw, Wadkins & Olafson, 2007). Finally, grounded theory may be supported in research by both qualitative and quantitative data "…grounded theorists … offer the grist for emergent hypothesis …" (Charmaz, 2007, p. 101).

Symbolic interaction. This is a theoretical perspective that is derived from pragmatism (Bryant & Charmaz, 2007). This perspective assumes that "…people construct selves, society, and reality through interaction" (Bryant & Charmaz, 2007, p. 610). These researchers further describe how in symbolic interaction, meanings arise through actions and these in turn influence other actions.

Theoretical Framework

It became apparent early in this study that the most appropriate framework with which to examine the concept of high academic achievement resulting from NZQA Scholarship was the DMGT developed by Gagné (2003; 2005). The rationale for selecting this model lay in Gagné's distinction between giftedness and talent, with talent being an outcome of a range of catalysts that were both environmental and intrapersonal. In his model, Gagné (2003) includes environmental catalysts that

comprise milieu: physical, cultural, social and familial; individual: parents, family, peers, teachers, mentors; and, enrichment; and provision: curriculum, pedagogy, administrative, grouping and acceleration. The intrapersonal catalysts within this model incorporate physical and mental characteristics, awareness of others and, motivation and volition. Each of these catalysts are influenced by Chance and by the developmental process where informal and formal learning and practising occurs (Gagné, 2003). As many of these factors – for example, parents, family, peers, teachers – were also indentified by the participants in this study as factors that had influenced their NZQA Scholarship success, it appeared that the components of Gagné's DMGT model bore a resemblance to students' perceptions of their NZQA Scholarship experience. Therefore Gagné's DMGT provided the framework with which to review the literature and the findings of this study that investigated the perceptions of those students who had demonstrated high academic achievement through their success in NZQA Scholarship.

Deeper consideration of each of these catalysts – *Intrapersonal, Environmental,* and *Chance* – revealed a range of factors that align with the Ministry's statement describing talented individuals having cognitive, creative and affective characteristics that enable them to achieve outstanding performance in one or more areas (Ministry of Education, 2002).

Interviews

An interview is defined by Lofland and Lofland (1995) as an in-depth exploration of a particular topic with a person who has had the relevant experiences. The overall aim of an interview is to elicit the participant's response to that experience. Typically in grounded theory the interviews combine to saturate the categories which have emerged from the data analysed (Creswell, 1998). Charmaz (2007) advises the use of broad, open-ended interview questions in interviews that will be analysed using grounded theory. She recommends the interviewer encourage unanticipated statements and stories to emerge through having open-ended non-judgemental questions.

Survey

One reason for using a survey is to generalise from a purposive sample so that inferences can be made about attitudes, characteristics and behaviours of the

population (Babbie, 1990). A researcher may use on-line surveys to elicit responses from participants (Sue & Ritter, 2007).

Literature has identified factors that determine the format of surveys and interviews (Berdie, Anderson & Niebuhr, 1986; Creswell, 2009). Berdie et al (1986, p. 3) recommend that the survey contain "properly phrased and administered questions." Creswell (2009) suggests the rapid turnaround that can be part of a survey is one advantage of using this method to collect data, in addition to the convenience and the ability to enlist participants who are wide-spread. Creswell (2009) also suggests that survey results enable the researcher to make generalisations about the population that was sampled.

Data analysis

Qualitative data

Cohen, Manion and Morrison (2007) explain there are three types of data coding when grounded theory is used: open, axial and selective coding (Cohen et al., 2007). They further describe these codes as:

a. Open coding: the data are explored and codes are developed, categories and subcategories emerge and integrated if this is applicable. Process continues until all coding is completed.

b. Axial coding: this determines any links between categories and codes.

c. Selective coding: identifies a core code and this is the relationship between other codes and one code which is then compared with pre-existing theory.

Coding and recoding continues until saturation of data. Data are generated from the findings, and multiple stages of data collection are employed, with continual comparison of data leading to the emergence of categories from the findings (Creswell, 2008). Charmaz's (2007) interpretation of grounded theory focuses on deriving meanings attributed by the study's participants. Charmaz (2007) differs from Cohen et al., (2007) in regard to coding. Where Cohen et al., (2007) describe open, axial and selective coding, Charmaz (2007) prefers the use of narrative to provide explanation and deeper analysis of assumptions, with the generation of memos – a pivotal step in grounded theory where the researcher writes memos that help analyse ideas about their codes (Bryant & Charmaz, 2007) – used to guide this process.

Quantitative data

In a mixed methods study statistics provide "a means to create meaning" (Plano Clark & Creswell, 2008). Cohen, et al., (2007) describe how it is possible to collect data from one source, transfer it to another and compare between the two types of output. Statistical Package for Social Scientists (SPSS) is a statistical package commonly used to manage and analyse data through the production of statistical analyses and graphical presentation of the data (Ary Jacobs, Razavieh, & Sorensen et al., 2006). This software package includes statistical tests to investigate relationships among variables. For example, Pearson Chi-square is a non-parametric test used to look for association when dealing with nominal or ordinal level data to determine if two categorical variables are related (Connolly, 2007).

One other programme offering statistical analysis is Survey Monkey (www.surveymonkey.com). Survey Monkey is an on-line survey tool that enables the subscriber to create and publish custom surveys. When compared with SPSS, Survey Monkey is limited in the types of analyses it can perform. However, useful functions in Survey Monkey include the filtering and cross-tabulation of data, and the production of graphs and some frequencies.

Triangulation – within methods and between methods

Triangulation involves using other sources to validate or invalidate information, with the use of multiple data sources helping strengthen emerging theory (Berg, 2004; Denzin & Lincoln, 2005). Triangulation may occur across qualitative and quantitative data. The use of triangulation across two methods (qualitative and quantitative) is described as the "between methods" type (Denzin, 1978, p. 302). Triangulation between two methods is considered to be predictive of more valid results and is described by some as "the archetype of triangulation strategies" (Plano Clark & Creswell, 2008, p. 109).

Participant sampling

"An excellent participant for grounded theory is one who has been through, or observed, the experience under investigation" (Bryant & Charmaz, 2007, p. 231). Several methods are described for gaining a participant sample and the type of research that is to be conducted can determine the type of participant sampling that is appropriate.

Purposive sampling

Purposive sampling is defined as the sampling of a deliberate selection of participants who are intentionally chosen to provide information that cannot be gained from other sources (Maxwell, 1997). In grounded theory initial sampling of a population leads to generation of data. When these data are analysed and theory begins to emerge, data may indicate a specific group or sub group of the sample that require further focussed sampling (Charmaz, 2007). This type of sampling is known as theoretical sampling.

Theoretical sampling

Theoretical sampling enables the researcher to collect data that assist in providing a deeper focus and more refined categories in the emerging theory (Charmaz, 2007). Theoretical sampling is an important component of developing grounded theories and, as Charmaz (2007) describes, can be used to elaborate meaning and discover any variations within categories.

Validation of the emerging theory

An important component of grounded theory research is that of 'member checking' (Charmaz, 2007). Member checking is described as "…taking ideas back to research participants for their confirmation" (Charmaz, 2007, p. 111). This is one way to validate emerging theory with the participants. Bryant and Charmaz (2007) suggest that if the researcher is unable to gain feedback from the original participants, it is acceptable to do so from other individuals who share a similar profile, thus aiding validation of the data and emerging theory.

Ethical considerations

Before designing a project it is important that the researcher give consideration to ethical practices and anticipates where ethical issues could arise (Creswell, 2009). Creswell suggests that these issues fall into three areas pertaining to research: ethical issues in data collection; ethical issues in data analysis and interpretation; and, ethical issues in writing and disseminating the research (2009).

Ethical issues in data collection

Researchers need to identify a number of important issues before they commence data collection (Creswell, 2009). When working with human participants there is a need for

the researcher to ensure the participants are protected against any issues that may arise as a result of the research that may reflect poorly on them or their organisation (Isreal & Hay, 2006). Institutional research that involves human participants requires ethical approval from the Human Ethics Committee of the institution to which the researcher is affiliated prior to data collection. This approval requires the researcher to identify any potential risk to participants arising from their involvement in the study, and to ensure that full informed consent is obtained from each participant before any data are collected. The consent form needs to provide participants with information that makes clear their rights if they participate in research (Creswell, 2009). Plano Clark and Creswell (2008) reiterate the importance of participants giving informed consent and include with this the right of the participant to withdraw from a study at any time.

Ethical issues in data analysis and interpretation

Patton (2002) suggests that there is potential for the researcher to be privy to confidential information that may potentially harm the participant. This information could, for example, be elicited from a participant during interview. This example highlights the importance of the researcher ensuring participants remain anonymous and to do this they are usually assigned a pseudonym.

Storage and destruction of data after the ethical committee's requisite time period needs consideration as does the transparency pertaining to ownership of the data (Creswell, 2009). It needs to be made clear to participants if, for example, the researcher intends to disseminate the findings in papers and at conferences. Participants ought to be aware of this at the time they are invited to provide consent. In addition, the researcher needs to ensure that his or her interpretation is an accurate reflection of the data. There are a couple of ways in which this can be achieved: through triangulation with other data sources; or, through participant or member checking (Charmaz, 2007; Plano Clark & Creswell, 2008).

Ethical issues in writing and disseminating the research

Aside from ensuring they do not falsify findings in order to suit their needs, the researcher also needs to ensure that participants are given the opportunity to read for themselves the findings of that study (Creswell, 2009).

Limitations

Through disclosing any possible biases prior to conducting the research one potential limitation can be avoided – that of Hermeneutic interpretation of data. Callahan and Moon (2007) state the importance of the researcher declaring any interest or bias they have that may influence the research process.

The use of a concurrent embedded strategy mixed methods design may create further limitations in a project. If the two databases (qualitative and quantitative) are compared, discrepancies may be identified which will create a need for resolution (Creswell, 2009). Where the two methods are unequal in their weighting, the approach may result in unequal evidence in the study which may disadvantage the interpretation of final results.

Validity and reliability

Validity – more recently termed 'legitimation' – needs to be built into the design stage of any study and adjusted and modified as limitations are identified (Creswell. 2009). This assists in minimising any breach of validity later in the study. There are several threats to the validity of concurrent designs in mixed methods research and steps can be taken to minimise these. These threats relating to data collection issues include:

- Selecting different individuals for the collection, and
- Not following up on contradictory results

Threats to data analysis include:

- Inadequate data transformation approaches, and
- Two types of data not addressing the same question.

Mixed methods research is described as being well-positioned to minimise any potential weakness legitimation, because the researcher will have designed a study that combined two (or more) methods (Plano Clark & Creswell, 2008). These researchers suggest that it is important that the study has been examined to ascertain the extent to which the weakness from one approach can be compensated by the other approach, then "plan and design the study to fulfil this potential" (Plano Clark & Creswell, 2008, p. 291).

A further threat to validity can occur through researcher interpretation of data if that interpretation is incorrect or biased (Creswell, 2009). As already discussed providing participants with an opportunity to view the researcher's interpretation serves to minimise this risk (Charmaz, 2007). Minimising the time between engagement with data collection tools (e.g. on-line survey and interview) and ensuring the instruments match the respondents' time span are also advisable in preventing any breach of validity (Cohen et al., 2007).

The challenge of the literature review

The literature review aims to share the results of other studies that are similar to the topic being researched, in addition to relating the study to others that are larger (Creswell, 2009). The placement of the literature review in grounded theory is much contested and disputed (Charmaz, 2007). Novice grounded theorists are encouraged to delay the literature review to enable them to develop previously unfound theories (Glaser & Strauss, 1967). Another source claims the idea of "…postponing exploration of the literature usually emanates from experienced researchers, who themselves have developed an extensive knowledge of a vast mass of literature…" (Bryant & Charmaz, 2007, p. 20).

In mixed methods research the researcher uses either a qualitative approach *or* a quantitative approach to developing the literature review (Plano Clark & Creswell, 2008). These approaches differ in that a qualitative study may use literature sparsely at the beginning, providing an inductive type design. A quantitative approach might use literature deductively, and as a basis for forming the research questions and hypothesis (Plano Clark & Creswell, 2008).

Summary

This chapter has identified methodology and methods for collecting data that comprise mixed methods study using grounded theory. The next chapter will identify specific procedures and practices as they applied to this research project in addition to identifying limitations of the study and describing ways in which this research was validated.

CHAPTER 4
Methodology and Methods: This Study

The previous chapter provided a description of the methodology and research methods through which data are generated, gathered and analysed. This chapter serves to introduce the participant sample and to describe the ways in which data were collected and analysed in this study of NZQA Scholarship students. This chapter begins by introducing the researcher and describing the origins of the project.

The Researcher

From the outset, it is important that the researcher identify his or her "… biases, values and personal background … history, culture and socioeconomic status, that may shape their interpretations formed during a study" (Creswell, 2009, p. 177). This researcher is female and a Lecturer in the School of Educational Psychology and Pedagogy at Victoria University, Wellington. Her previous research has included participation in a review of Ministry of Education Talent Development Initiatives, an investigation into appropriate inclusive practices in pre-service teacher education at Victoria University, and consideration of appropriate classroom programmes for underachieving high ability students. She has worked in a range of differing quintile schools within New Zealand. With one exception, these were all primary schools. The researcher has a Masters of Education (Honours) completed through thesis and course work. Three of the papers and the thesis undertaken for that degree focused on the education of gifted and talented students. She was a member of staff in a high school in 2004 when NCEA was still relatively new to New Zealand teachers, and NZQA Scholarship was not yet in its current form.

With the exception of two participants, one who had been taught at primary school by the researcher and one other who had attended a school where the researcher had taught, none of the participants were known to the researcher. Neither of the two known participants were selected for interview. This was a conscious decision made in order to avoid any perception of hegemony arising from these students having previously being in the role of 'student' when the researcher was 'the teacher'.

The researcher developed an interest in NZQA Scholarship through NCEA and Scholarship results obtained by students at her sons' state secondary school. These

data were disseminated to parents and caregivers through the school newsletter and evoked the researcher's curiosity given that this school appeared to produce results that were well above the national average. It seemed that this state school was promoting high-achievement in large numbers of students. The researcher's interest was further aroused through the information provided in the media about NZQA Scholarship, and through other schools' criticism of both NCEA and NZQA Scholarship. These factors combined with the researcher's interest in appropriate educational opportunities for high-ability students, suggesting an examination of NZQA Scholarship from successful students' perspectives, would be an appropriate – and as yet un-researched - topic to investigate.

In identifying any potential bias that may exist the researcher states her belief that *all* students are entitled to receive appropriate educational provisions, whether these are remedial or a form of enrichment or acceleration. She values education and actively encourages her students to pursue qualifications in their areas of interest, modelling this through her own studies.

Methodology: Philosophical Worldview

In this study the research was informed by the researcher's worldview of pragmatism. Pragmatism is recognised as important in mixed methods study as a pragmatic approach is one that focuses attention on the research problem and then uses pluralistic approaches to ascertain knowledge about the problem (Creswell, 2009). This pragmatist philosopher identifies meaning through practical actions and she views outcomes of this study as linked rather than separate. This linking is evident in the emergent hypotheses that are posed later in this report. These hypotheses make it clear that the grounded theory employed for this study resulted in ideas that connected, through the students' perceptions and experiences of NZQA Scholarship. These provisions are best described as an 'optimal match' the term that is used to describe the state that is achieved when the curriculum matches the student's ability, rather than his or her age (Benbow & Stanley, 1996).

It would appear that a pragmatic approach that leans towards symbolic interactionism is well suited to this NZQA Scholarship study as a pragmatic worldview is purported to have many elements that align with those in this study which:

- has both open ended and closed ended questions with both qualitative and quantitative data;
- uses pluralistic approaches to derive knowledge about the problem, and is orientated towards practice (Tashakkori & Teddlie, 1998).

Symbolic interactionism also 'fits' this study as the meanings derived from data were the results of actions that occurred through the process of students aiming to achieve NZQA Scholarship.

Methodological conceptualisation

Figure 1 provides a visual conceptualisation of the methodological overview and the methods employed in this research. The methods of data analyses are named and the data analyses tools are also cited. Both sources of data were used to generate theoretical propositions. Each of these aspects is explained further in this chapter.

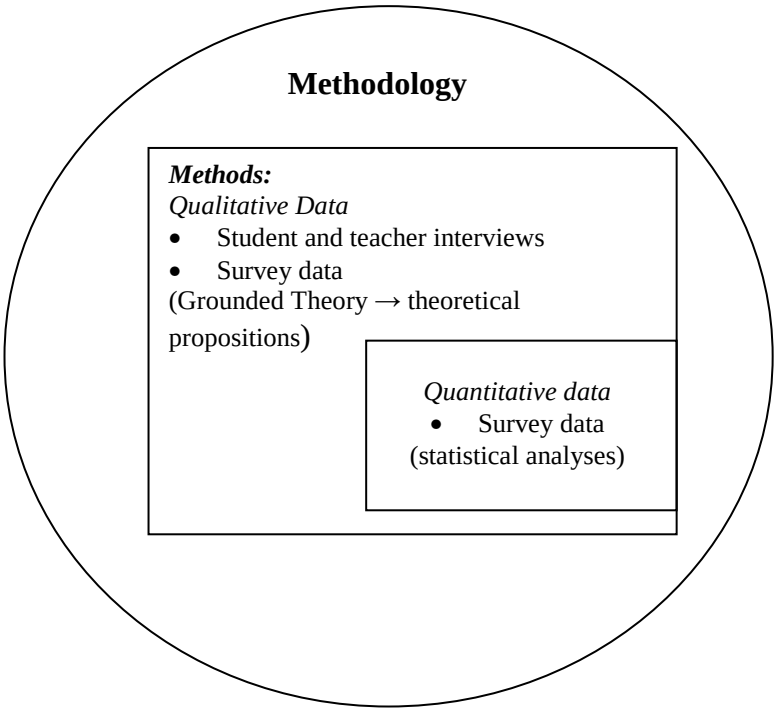

Figure 1: ***Conceptualisation of methodological overview including methods***

The rationale for using a mixed methods approach in this research project was to enable the researcher to explore qualitative data gained from interviews and open-ended survey comments, and to incorporate these with the results from the quantitative analyses of students' on-line survey data. Thus these two methods of

data gathering and analysis complement each other. Furthermore, aggregated qualitative data help to describe situations identified in the quantitative data enabling the researcher to give voice to the student participants, and allowing their statements and observations to provide an important dimension to the study. In addition the use of both qualitative and quantitative data enabled triangulation to occur between data sets. This triangulation is described later in this chapter.

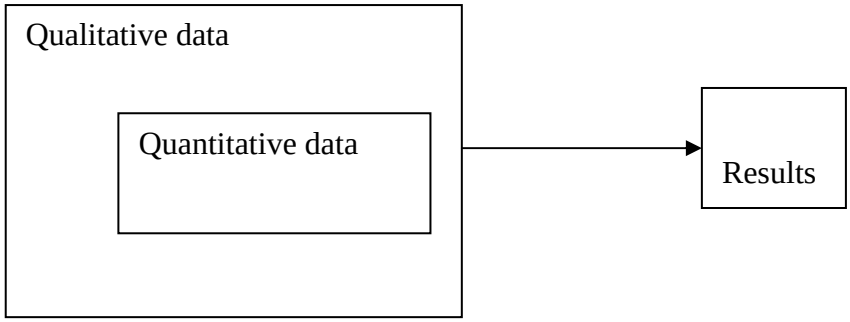

Figure 2: ***Visualisation of the mixed methods approach used in this research***
(Adapted from Plano Clark & Creswell, 2008)

As Figure 2 shows, this mixed method concurrent embedded design consists of two types of data: qualitative and quantitative data (Creswell, Plano Clark, Gutmann & Hanson, 2003). A concurrent embedded approach to research has a "…primary method that guides the project and a secondary database that provides a supporting role in the procedures" (Creswell. 2009, p. 214). In this research the qualitative data were the primary method and the quantitative data were the secondary database that provided the supporting role. The data are mixed at the design level which in this case included the questions in the on-line survey (Caracelli & Greene, 1997).

As quantitative hypotheses were formed and analysed they helped to explain and triangulate with the qualitative data. In this study the qualitative and quantitative data from the on-line survey were collected simultaneously. Additional qualitative data in the form of interviews assisted the researcher in probing themes that had emerged from the on-line survey. Therefore, in this study the two data sources – qualitative and quantitative – were collected concurrently and mixed, with the quantitative data embedded in the more heavily weighted qualitative design.

This process and the process that resulted in the emergence of theoretical propositions are illustrated in Figure 3 which shows the inductive research process in this mixed methods study. Figure 3 shows where purposeful sampling was used and

where theoretical sampling was introduced, two aspects of this study that will be discussed further in this chapter. Figure 3 also shows where data were analysed and coded, a process consistent with that described in grounded theory in which theoretical propositions may be an outcome. In addition, this figure shows the logical process of gathering information and eventually reaching the end point, that of generating theory grounded in the information provided by participants.

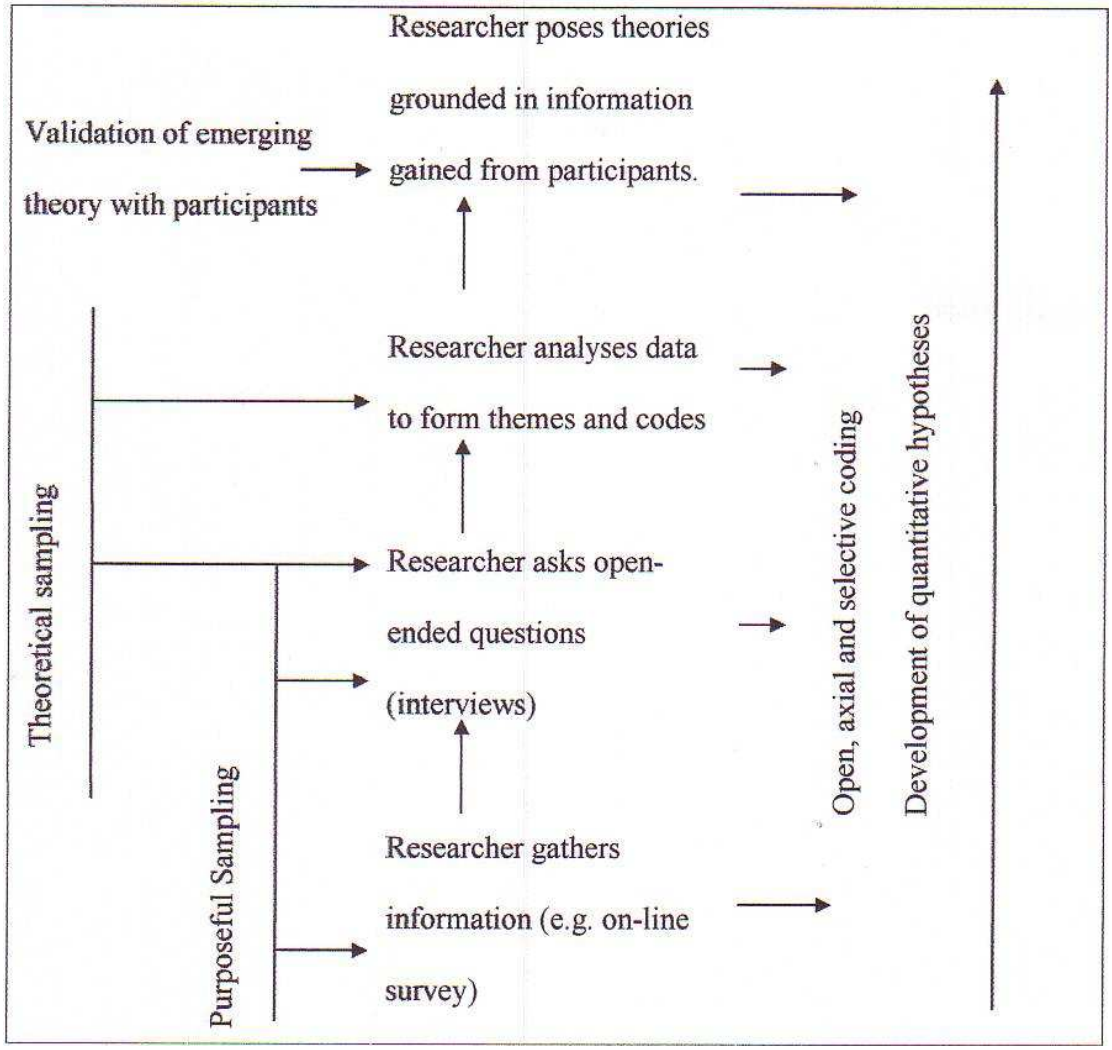

Figure 3: ***The inductive logic of research in this mixed methods study***
(Adapted from Creswell, 2009, p. 63)

Qualitative and Quantitative Data in Gifted Studies

As Callahan and Moon (2007) described research into giftedness may be either, or both, qualitative and quantitative, with quantitative research used to describe trends and to explain relationships and qualitative research exploring experiences and providing descriptions of stories and situations. These actions are appropriate in the gathering and interpretation of these Scholarship data as qualitative data were collected and analysed and quantitative data were used to look for frequencies and

provided a further form of triangulation between data sets. Furthermore, each of those keys described by Callahan and Moon (2007) has been used in this chapter of the research, as a guide for the researcher and a means of ensuring the tenets of 'quality' research in gifted education have been observed.

Grounded Theory

This research aimed to elicit student perceptions of those factors that facilitated their success in gaining Scholarship. It would appear that this is one of the first investigations into an aspect of the NZQA Scholarship and therefore "navigating relatively uncharted water" and well suited to the application of a grounded theory (Stern, 1995, p. 30), albeit a merging of several versions of grounded theory. Appropriating different components of several versions of grounded theory, appeared important as no one version met the needs of this study. There are multiple interpretations of grounded theory, and as LaRossa (2005) acknowledges, the interpretations and guidelines seem confusing and unclear.

Creswell (2005) suggests that the researcher may choose to use theoretical propositions (or hypotheses) to convey a theory. This 'fits' this NZQA Scholarship research, even more so when one includes Dey's (2003) description of the need for emerging theory to focus on the ways individuals interact in relation to what is being studied. As stated, the focus in grounded theory is on behaviour, and this is consistent with the aims of this study where the focus was on exploring those factors and behavioural choices to which students attribute their Scholarship success. Furthermore, grounded theory provides tools for analysing processes (Denzin & Lincoln, 2005; Strauss & Corbin, 1994, 1998).

Consistent with the work of others, the theoretical propositions that emerged from the data gathered generated rather than validated a data-based theory (Schraw et al., 2007). Therefore these propositions were a means of promoting formative inquiry into NZQA Scholarship and those factors students consider to have facilitated their success. Finally, grounded theory in this research is supported by both qualitative and quantitative data. In this study both qualitative and quantitative hypotheses were possible: where the quantitative data are embedded in the qualitative data, the quantitative hypotheses emerged from findings that were the result of the iterative

process of identifying themes and concepts in the qualitative data. Qualitative hypotheses emerged through abductive inference that involves consideration of all possible theoretical explanations for the data, forming a hypothesis for each possible explanation, and then checking them. Appendix A details the iterative process of grounded theory that was used in this research project.

Data Collection

The main sources of qualitative data in this research were 18 semi-structured telephone interviews with students, with additional responses provided by the 332 students in answer to open-ended questions in the on-line survey. The first ten student interviews were identified through student availability during the time period the researcher had available, and through the intentional over-sampling of students from low quintile schools. The eight subsequent student interviews formed theoretical sampling and those interviews were based on data that had emerged from the initial interviews. Interviews with two teachers who had been named by students in the survey were used to follow up on findings from the student interviews.

During the first ten interviews, it became obvious that students perceived their teacher as someone who was important in their success. It was also evident that some students had negative experiences of teacher support. It appeared that those who cited negative experiences were from schools with low quintiles, and for that reason, theoretical sampling led the researcher to target individuals from schools with quintiles[2] other than low (1 or 2).

Student and teacher interviews

In this research, students and teachers were giving their responses to their experiences with NZQA Scholarship. In total, this study and the pilot study involved interviews with 34 students. In all, the questions that were posed for this research were both loosely guided exploration of topics that included semi-structured focused questions. Appendix B contains a set of indicative questions asked during student interviews. These questions focussed on eliciting student responses to questions pertaining to the perceptions of their Scholarship teacher, the ways in which their

[2] Quintile refers to the Ministry of Education practice of grouping schools on the website 'Education Counts', in pairs of deciles (decile 1 & 2 = quintile 1, deciles 3 and 4 = quintile 2, deciles 5 and 6 = quintile 3, deciles 7 and 8 = quintile 4, deciles 9 and 10 = quintile 5).

family had supported them during study leave, and the influence of their peers and friends.

With the exception of one interview where the student asked to have the interview hand written and not recorded, the telephone interviews in 2008 were taped and transcribed. Where student or teacher participants requested changes made to their transcript, the transcript was altered to accommodate these changes which most frequently meant providing information the researcher had been unable to glean from the tape due to sporadic poor audibility in the quality of the taping.

On-line survey

The rationale behind the use of an on-line survey rather than using standard mail post was the assumption that many of the intended participants may already have moved away from where they were living at the time they sat Scholarship, for example, to university or overseas, and it was hoped that it would prove easier for them to supply a response via the internet. The survey was cross-sectional with the data being collected at one point in time.

Acting on the advice of Berdie et al. (1986, p. 3), care was taken to ensure that the survey contained "properly phrased and administered questions." This involved adjusting some of the phrases used in the on-line survey to ensure they were written in language that was appropriate for the age group completing the survey.

A copy of the 2008 survey is provided in Appendix C. The survey was designed following a review of the literature pertaining to definitions of giftedness and factors identified by New Zealand researchers as those factors that facilitate students in achieving 'top' academic success (Bevan-Brown, 1999; Moltzen, 2005; Riley et al., 2004; Taylor, 2001). In addition, the survey took into consideration the available literature relating to the development of Scholarship in its present form and its background in the NZQA examination system now implemented in New Zealand secondary schools. Additional survey items relating to student choices on leaving school were borrowed with permission from a New Zealand study on student motivation (Meyer et al., 2006).

The theory underpinning the survey related to Gagné's (2003) theory that distinguishes between giftedness and talent, suggesting that gifts are the result of natural ability, and talent is the result of acquired ability. Using the DMGT survey items were planned to probe factors influencing achievement relating specifically to intrapersonal catalysts; environmental catalysts; and the role of chance in student success. A description of survey items follows:

a) Identification

Students were asked to enter their National Student Number (NSN) as this was expected to provide a match with the information on their consent forms and enable the researcher to contact students and conduct interviews. Students were also asked to provide their school name, gender and student status (i.e. whether they were a domestic NZ/permanent resident or an international student). The school name was used to assist the researcher in verifying the school's decile rating. Students were invited to specify the subject or subjects they received awards for and the type of award they received (i.e. Scholarship Award; Top Subject Scholar Award; Outstanding Scholar Award; and Premier Award).

b) Scholarship specific

Information relating to the decision to sit for Scholarship; the hours of study and the people and things that may have influenced their success in Scholarship included items relating to characteristics that have been identified as part of Attribution Theory (Weiner, 1972; 1974; 1985). This included student perceptions of intrapersonal factors that may have influenced their success. Those factors were: ability, effort, interest and enthusiasm, luck and persistence. Students responded to items rating the extent of each factor using a likert-type scale where:

1 = no influence at all,
2 = this had a little influence on my successful results,
3 = this had some influence on my successful results, and
4 = this was a big factor in my successful results.

Findings in this section were initially aggregated using Survey Monkey then entered in SPSS to test for statistical association using Chi-square. Where

significance was identified further analysis was undertaken to source possible reasons for the association.

c) Student perception of school factors

Items in this section were borrowed from the motivation research study (Meyer et al., 2006). Students were asked to use the phrases "not at all true", "mostly not true", "sometimes true", or "always true" to describe comments relating to their experiences and perceptions of school and study. Section Six asked students to consider the people who may have assisted in their success. Students used a likert-type scale to rank the three people who had the greatest influence on their Scholarship results. The scale had three numbers: 1 = greatest influence, 2 = 2nd greatest influence, 3 = 3rd greatest influence. This list comprised: teacher(s), mother, father, sister, brother, other family member, mentor, friend, friends, principal, coach, and 'other'.

d) Extracurricular activities

Following on from the research of Csikszentmihalyi et al. (1993), students in this study were given an opportunity to record any extracurricular activities they were involved in during the last three years at high school. This list included part-time work students may have engaged in, with these items having been borrowed from NCEA Motivation research (Meyer et al., 2006). Students were asked: *Please list any activities you were involved in during your last 3 years at high school.* Items in the activity list were: athletic activities (e.g. sports)**,** school clubs (e.g. debating)**,** performance clubs (e.g. kapa haka)**,** national or international teams**,** competitions special/accelerate/advanced classes**,** part-time employment**,** community work**,** church, and 'other'.

e) Awards and achievements

Students were asked to list any awards, achievements or leadership opportunities they were recognised for in the last three years at high school.

f) Future plans

The penultimate section asked students to describe their current plans for the future, picking three items from a list of possible choices (Meyer et al., 2006).

The final item was a box provided at the end of the survey for students to supply the researcher with any supplementary information they wished to include.

Data Analysis

Qualitative data

In this study, coding and recoding continued until saturation of data which in this research meant no new theory was being generated. Data were generated from the findings as consistent with grounded theory where multiple stages of data collection are employed, with continual comparison of data leading to the emergence of categories from the findings (Creswell, 2008).

The teacher and student interviews, in addition to the anecdotal survey comments, were analysed according to grounded theory guidelines, albeit from a merging of ideas of several key grounded theorists and interpreters of grounded theory. Where Charmaz (2007) spurns the use of the predetermined coding described by Cohen et al. (2007) (open, axial and selective coding), this coding was used in the initial stages of this data analysis to provide a framework for the qualitative comments. As the theories emerged, the project leaned more towards the approach defined by Charmaz, with the narrative providing greater explanation and deeper analysis of assumptions than one might find using the strictures of the Strauss coding (Charmaz, 2006; Creswell, 2008).

In this research initial analysis of interview transcripts began by entering data (transcripts) into a single file that combined to form a single data set for analysis. From this point onwards, most data were analysed using grounded theory coding to develop categories, determine links and identify core code to compare with pre-existing theory (Cohen, et al., 2007). Data were broken apart into lines initially, then into paragraphs or sections that were rearranged, enabling the researcher to identify themes that emerged and to compare and contrast these with other parts of the data. Constant comparison between the three types of coding – open, axial, and selective – continued until the data were completely accounted for (Creswell, 2006). This frequently meant the development of new themes or themes that demonstrated an inter-relatedness of concepts. Identification of new themes (e.g. the link between quintile and student perceptions of support) meant returning to data that may have

been considered completely explored to reconsider other possible links with the new theme. Discrepant and negative cases were used in this constant comparison method and resulted in providing important data that when compared with other data across the same topic, led to the development of new previously undiscovered themes. Key themes were labelled using participants' own words.

The other analysis that occurred with qualitative data was that of data transformation (Creswell, 2009). This process enables the researcher to quantify qualitative data. In this study, data transformation was used in the creation of matrixes that quantified student data pertaining to their intrapersonal factors that influence motivation, extra-curricular activities, school awards and part-time employment.

Colour coding was used to assist in analysing data, and electronic charts were developed at each stage of analysis with emerging themes evidenced by student or teacher comments. Charts were also created to show relationships. Although unpublished in this document, these visual images served to provide indicators and codes that generated further categories and themes. They also enabled the researcher to visually identify new codes, or themes. The data were triangulated with responses from the student interviews, on-line survey and the teacher interviews. Although a core code relating to students and their perceptions of teachers' role in their success emerged fairly rapidly, other codes changed frequently and were constantly compared across interviews and survey responses, between male and female and between quintile groups. There were many notes and tentative questions and hypotheses annotated on the transcripts and these were updated, revised and sometimes deleted as more data either confirmed or refuted the original hypothesis. Frequently the scrutiny of data identified areas for further research. There were times when it was challenging and difficult to detect themes in underused data, and it was important for the researcher to remember that this frustration can be part of using grounded theory. This is described by Cohen et al. (2007) as a need for the grounded theory researcher to "…tolerate confusion and regression (feeling stupid when the theory does not become immediately obvious)…" (p. 491).

As the data transformed into selective coding where the core code was examined against possible relationships with other codes, it became important to identify

literature that could be compared with these codes. This process identified gaps in the literature in relation to some of the key findings.

Quantitative data

In this research the statistical data were gathered from the questions in the on-line survey and analysed using either of the two data tools, Survey Monkey or Statistical Package for Social Scientists (SPSS), or by both tools. Statistical data were gathered in the on-line survey through the survey host Survey Monkey. Amongst other functions Survey Monkey can apply filters that enable data to be aggregated or selected. In this study some data were analysed initially by Survey Monkey and then by SPSS with comparison made between the two types of output (Cohen et al., 2007). Both studies – the Pilot Study and the subsequent study – were hosted by the on-line survey tool Survey Monkey. Survey Monkey collated data that produced frequency of item selections in tables and graphs. The statistical components of these data were transferred to Excel, and then into SPSS that generated further tables and introduced frequencies and tests for significant differences. Pearson Chi-Square was used to test if two categorical variables were related. As a number of cells breached the assumptions for a Chi-Square (more than 20% of the categories had frequencies less than 5), it was necessary to conflate some of the categories of one or both of the variables so that the frequencies in each cell were increased (Connolly, 2007). In this study the alpha level for the Pearson Chi-Square was set at .05 (p = .05). Consistent with practice when using a 2 x 2 contingency table Phi has been used as the measure of effect size where significance was identified (Connolly, 2007; Morgan, Reichert & Harrison, 2002). The strength of relationship between variables was measured using a Spearman correlation coefficient. If a value of 0 is found, there is no relationship; if it is 1 or -1 then there is a perfect relationship (correlation) between two ordinal variables (Connolly, 2007).

Missing data

In accordance with Victoria University College of Education Ethics Committee guidelines, participants were not compelled to answer any question. It is evident from the 'missing' data that some students refrained from responding to one or more items in each section.

Pilot Study

This project was trialled in 2007, when the researcher invited a purposive sample of those students who gained NZQA Scholarship in 2006 to participate in the research. To assist with the gathering of a purposive sample, a decision rule was applied to preliminary school selection. Using the NZQA Scholarship Statistics site, 26 secondary schools that attained a higher than national percentage (19.93%) of successful Scholarship results in 2005 (the year previous to the group being sampled) were written to by the researcher to request that they forward an information package about the research to eligible students. This school information was obtained through the NZQA website. The rationale behind using schools that had been successful in Scholarship in 2005 was related to the researcher's assumption that the invitation to participate in research would bring about a plethora of responses. For this reason it was decided to apply a decision rule and thus make more manageable the predicted 'tidal wave' of responses.

The selection criteria for the first mail-out to schools stated that these students needed to have gained two or more Scholarships in the 2006 round. In addition selected schools needed to 'fit' into one of three decile bands:

1. high decile (8, 9 and 10)
2. mid range (4, 5, 6 and 7)
3. low range (1, 2, and 3)

Schools were also selected on the basis of gender and final numbers of schools contacted in this first mail-out are shown in Table 1. Only two low decile boys' schools met these criteria.

This initial attempt to gain a purposive sample yielded a low return (n = 19). A second and third mail-out removed the criteria of two or more Scholarships and included students from independent and private schools in addition to those from state and state integrated. Each approach was preceded by a telephone call from the researcher to the Principal's assistant or designee eliciting the school's willingness to forward the information letters and consent forms to successful Scholarship students from the previous year.

Table 1: Pilot study initial mail-out: Number of schools approached in 2006

	School Type		
	Boys	**Girls**	**Co-Educational**
High decile	3	3	3
Mid decile	3	3	3
Low decile	2	3	4

Difficult to gauge from the NZQA website site was the number of students within each school who had been successful: the site describes the number of Scholarships gained in each subject in each school but does not detail the number of students amongst whom these subjects were spread. This made the sending of information packs to the students an unscientific 'hit and miss' affair. When questioned on the number of students overall who had received Scholarships in their school, the Principal's assistant or designee was often unable to provide this information. The resulting participants in the Pilot Study and their school decile group are shown in Table 2.

Table 2: Pilot study: Participants by school decile (2007)

	School Deciles of Pilot Survey and Interview Participants				
	High	**Mid**	**Low**	**Unspecified**	**Total**
Survey	33	11	3	1	48
Interview	10	5	1	0	16

Changes to the on-line survey

The Pilot Study trialled research procedures with four groups of people: current NCEA candidates, previous NCEA students, university doctoral candidates and colleagues working in 'gifted' education. As a result of their feedback, a number of changes were made to the on-line survey for 2008. Item wording was changed to reflect more student-focused language, and the word 'mentor' was included in the list of people who may have influenced students. Also included was:

- information about special, advanced or accelerate classes in which the students may have participated,
- an item asking about any competitions they had been involved with,
- the opportunity to choose one factor *overall* that had influenced their success, and

- a section that asked students to indicate whether or not they had received their NCEA with an endorsement.

One of the most important changes involved how the survey was distributed. Due to the low response rate in 2007 as a result of direct mail-out by the researcher (N = 48), the NZQA managed the mail-out for 2008 and sent invitations to participate and consent forms directly to *all* students gaining at least one Scholarship in the 2007 examinations. This resulted in participation from a larger sample of students (N=332). The 2008 study research procedures were trialled by students who were sitting Level 3 NCEA that year. These students made no suggestions for changes.

Changes to interviews

There were changes to interviews based on those conducted during the Pilot Study and also based on the early interviews in the subsequent study. With the poor response from students in low decile schools in the Pilot Study, it was decided to oversample students from low quintile schools in the subsequent study. In addition, emerging theory that had become apparent during analysis of initial interviews of the subsequent study highlighted the importance of conducting theoretical sampling. Those students who were the theoretical sampling group were from quintiles other than those described as low (quintiles 1 and 2) quintile schools. They were from quintile 3, 4 and 5 schools.

In the subsequent study there was a change to the way in which interviews were recorded. The Pilot Study interviews were conducted over the telephone with each response handwritten then typed into a transcript. Transcripts were emailed to students for verification. In the 2008 the interviews – with one exception – were recorded over the telephone, then transcribed and sent to the participant for verification.

Triangulation - within methods and between methods

This Scholarship research used more than one type of triangulation. In the first instance "within method" triangulation occurs between the qualitative data with interview data from students and teachers and on-line survey results providing multiple comparisons (Denzin, 1978, p. 302). It was also possible to triangulate the data across the different sources: interviews in 2007 and 2008, on-line survey

comments in 2007 and 2008, and teacher comments in 2008. Once theories emerged, it was also possible to triangulate between types of data, for example using quantitative data to verify a theory that had emerged from the qualitative data (e.g., that there was difference in the views of male and female students in whether they always find time to study subjects in which they think they will be successful). This form of triangulation meant that emerging theory was either confirmed or rejected through the testing for statistical significance and correlation.

The Participants

Student participants

The male and female adolescents who were invited to participate in this 2008 study had been recognised by the New Zealand Ministry of Education as New Zealand's "… very top students based on their performance on external Scholarship examinations…" (Ministry of Education, 2005, p. 3). Students in this study participated in the on-line survey (N= 332) and/or an interview (n = 18). The teacher participants (N = 2) who were involved in this study were nominated or named by students who responded to the on-line survey. Students were selected for an interview based on their school quintile and their availability during the interview period. In addition to these students, another group was chosen to enable theoretical sampling to occur. This group comprised eight students (n = 8) who were selected for interviews to allow the researcher to pursue in depth the categories and theory that had begun to emerge from earlier interviews and on-line data. Theoretical sampling and the purposive sample are discussed in the following paragraphs.

Teacher participants

Two teachers participated in these interviews, while another four teachers named by students were approached to participate but did not reply to their emailed 'invitation to participate'. Three other teachers whom students named had left New Zealand and were not able to be contacted.

Purposive sampling

As already mentioned, the student sample gained in this research was that of a purposive sample. In this project, the sampling aimed to achieve representativeness across gender and school quintile to enable the researcher to gain perspectives from a purposive sample of NZQA Scholarship recipients who could be representative of a

larger group of students. A purposive sampling technique makes it possible to compare between different types of cases (Plano Clark & Creswell, 2008). In this study purposive sampling enabled comparison between gender or school quintile. Consistent with the characteristics of mixed methods sampling strategies, most of the sampling decisions were made before the study commenced. However, as already described, data that emerged during the study led to the inclusion of two teachers into the sample, thus enabling the researcher to test some of the theory that had emerged (Plano Clark & Creswell, 2008).

The Pilot Study sample included students who were male or female, from state, state integrated, independent or private schools from each decile with the exception of decile one and two since no students from these deciles returned consent forms indicating their willingness to participate. In the subsequent 2008 study the students were representative of the same schooling groups (state, state integrated, independent or private schools). Those students who were interviewed provided a larger sample of students from low quintile schools (1, 2 and 3) to redress the imbalance evidenced in the Pilot Study, in addition to students from both quintiles 4 and 5.

Theoretical sampling

In this study theoretical sampling evolved part-way through the interview process when emerging theory suggested a greater focus was needed to ensure identified categories and their properties could be refined. As stated, the over-sampling of students from low quintile schools was purposeful and aimed at re-dressing the imbalance that had occurred in the Pilot Study. With the theory that began to emerge it became important that ideas were further pursued with students who were not only representative of this selective sample but from quintiles other than low (e.g. quintiles 3, 4 and 5). To this end, six more students were interviewed, four from quintile 3 and one each from quintiles 4 and 5 (See Table 3).

Participant recruitment

Students

The mail-out that was managed by NZQA comprised an information letter and student consent form (Appendices D & E). Students willing to participate replied to the researcher by returning the 'consent to participate form' and were then emailed a link to the on-line survey. Return rates that translate to the number of participants completing

the on-line survey for the subsequent study are explained Table 3. As previously explained, the Pilot Study used high, mid and low decile groupings. High decile schools are those schools with decile ratings from 8 to 10, mid deciles from 4 to 7 and low deciles from 1 to 3. The difference in labelling between Table 2 and Table 3 signifies the change from school decile to school quintile between the Pilot Study and subsequent study. This is consistent with the way the Ministry of Education groups school data on its website 'Education Counts', using quintile to refer to each pair of school deciles (decile 1 & 2 = quintile 1, deciles 3 and 4 = quintile 2, deciles 5 and 6 = quintile 3, deciles 7 and 8 = quintile 4, deciles 9 and 10 = quintile 5).

As discussed earlier the total number of student participants in the second study was 332 (N=332) and this number included three students who were international students, with the remainder (n = 329) signifying they were New Zealand students. Two students did not enter the name of their high school using instead their current university name, and they are shown as 'unknown'. In 2008 a total of 18 students were interviewed and two teachers who were named by students as teachers who had influenced their success were also interviewed.

Table 3: Participants by quintile and gender (2008)

	On-line survey		Interviews	
Quintile	**Males**	**Females**	**Males**	**Females**
1	3	3	1	0
2	10	18	1	4
3	23	32	6	3
4	42	54	1	1
5	53	92	1	0
Unknown	2	0	0	0
Total	**133**	**199**	**10**	**8**

Teachers

The opportunity to enlist teachers as participants arose when teachers were identified and named by students in the survey as 'facilitators of student success'. Rather than gaining a teacher's perspective on Scholarship, the opportunity was more about testing ideas and possible theory that had arisen through coding of student interviews. In addition, the researcher was attempting to ascertain whether the perceptions of students aligned with the thoughts of successful teachers of Scholarship students.

Validation of the Emerging Theory with Participants

As theory emerged in this Scholarship research and a core code became evident, it seemed important that the researcher check these data with the participants. To this end, four students who had been interviewed in 2008 were contacted and an abstract from the emerged theories was shared with them. A typical response was:

> I would agree with the basics of your abstract completely. It doesn't all apply to me but the majority of it does and the facts that don't apply to me, do [apply] to a number of people I know. It's a pity New Zealand has such an entrenched tall poppy syndrome, else a lot more people would be achieving their potentials. (Jane q2, 2009 member check)

Ethical Considerations

This research involved collecting data from people and therefore, required and received approval from the Victoria University Human Ethics Committee. This process occurred four times – initially when the researcher applied for permission to commence the project and to pilot the on-line survey, when the data from the survey had generated theories that the researcher wished to probe further in interviews and a third time when the researcher required permission to begin the major, second study that also involved an on-line survey and student interviews. The fourth application was made to enable an approach to nominated teachers prior to interviewing. The initial application was approved in February 2007 and the subsequent applications were approved in June 2007, February 2008 and May 2008. The information letters and consent forms comprise Appendices D and E.

Possible ethical issues that the researcher identified at the design stage were addressed in a number of ways. In order to preserve the identity of students, their schools and the names of their teachers, a numerical coding system that related to the on-line survey tool (Survey Monkey) was implemented and the correlating identification data were made available only to the researcher. All identifying information gained during interviews was removed from the final report where students were assigned pseudonyms. This was particularly important in Scholarship subjects where only one, two or three Scholarships were awarded, thereby increasing the likelihood of identification of stakeholders. All data relating to the project were stored in secure locations that were either locked or password protected.

In addition and in accordance with Victoria University of Wellington ethical recommendations, no survey or interview questions were compulsory and students could decline to answer any section or part of a section of the survey. This meant that in the on-line survey the overall number of students responding to any section varied from question to question. To indicate this to the reader the researcher has highlighted the overall number of responses with a capital 'N', and any sub-group within that group is indicated with a small 'n'.

Limitations

It is important to reiterate that this research was not an attempt to generalise findings to the population of academically gifted high school students, rather this project aimed to identify patterns of characteristics of background factors that could be utilised to build a theory and test hypotheses about those characteristics and factors. With that in mind, a limitation in this study relates to the overall sample size. With the data available on the NZQA Scholarship Statistics page, it is not possible to calculate the number of students who gained Scholarship from the number of students who enrolled to sit Scholarship. This site provides the number of students in Year 13 (who did not all sit Scholarship) the number of subject entries (and the data collected in this study shows that many students were enrolled in more than one subject), and the percentage of Year 13 students with successful results. It does not show the number of students who enrolled to sit Scholarship exams, and therefore, it is not possible to calculate the percentage of students in this study as part of all students who attempted NZQA Scholarship in 2007.

There is a process for calculating the number of students who could be awarded a Scholarship in each year, and this is described in a communication from the Team Leader of the National Assessment Facilitator of the Secondary Examination Qualifications Division, NZQA:

> The 2005 SRG report into Scholarship made a number of recommendations. One of these related to the awards going to a portion (3%) of the level 3 cohort studying the subject. To identify the cohort we require information in December to determine this for each subject. To determine the cohort we identify candidates who have: a total of 14 or more credits from level 3 internal results and/or external entries. Note that it is external entries and not results or achievement that is required. The purpose of identifying entries/results in at least 14 credits is to identify the cohort of students who are undertaking study in that subject. (R. Emery, personal communication, February 27, 2008)

Despite the above information it was not possible to calculate the percentage that this participant sample represented of all students who gained NZQA Scholarship in 2007. This was due to a lack of information on the NZQA website that states the total number of students in Year 13 and the total number of subjects that were sat, but not the number of students who were successful.

A further limitation in this research related to attempts to gain greater representation of students in low quintile schools. In the Pilot Study, phone calls in addition to information mailed to those schools that were decile 1, 2, or 3 that had been successful in having students (or even a single student) gaining Scholarship, yielded a small return (n = 3). In the subsequent survey, the direct approach to students from NZQA yielded a higher return (number q1 = 5, number q2 = 28). From careful analysis of the NZQA site that holds information about every high school in New Zealand, it would appear that in 2007 fewer students in low decile schools gained Scholarships than students in mid and high decile schools. This could suggest that this study has a student sample that is numerically representative of the national data on students who gained NZQA Scholarship in 2007 with respect to proportions from different decile levels.

The importance of stating any biases at the outset of a project makes it important that the researcher reiterate her interest in educative practice at the beginning of this chapter, in addition to stating that she has worked as a facilitator of gifted programmes in Wellington schools.

Validity and reliability

Validity was built into the design stage of this study and adjusted and modified as limitations were identified. This assists in minimising any breach of validity later in the study (Creswell, 2009). It is also important that the methods (qualitative and quantitative) are considered to ensure that any potential weakness from one approach is compensated for by the other. In this study potential weakness was identified in the provision of statistical data as these data could fail to provide full explanation of a student's experience or perception. It would not be possible to interview every student and give them opportunity to provide narrative, and for this reason the survey contained open-ended questions that provided all students with the opportunity to impart narrative that further explained their contribution of quantitative data.

Additional identified threats to the validity of this concurrent design in mixed methods research and the steps that have been taken to minimise them are described in Table 4.

Table 4: Potential threats to the validity of concurrent designs in mixed methods research

Concurrent Designs (Embedded)	How the Threat was minimised
Data collection issues	
• Selecting different individuals for the collection	• Qualitative and quantitative samples were drawn from the same population (i.e. the data came from the same student group – students who gained NZQA Scholarship)
• Not following up on contradictory results	• Re-examination of data
• Weakness from the quantitative approach	• Compensated for by the inclusion of open-ended questions in the survey proving opportunity for students to provide narrative in addition to numerical data.
Data analysis issues	
• Inadequate data transformation approaches	• The transformation was made straightforward (e.g. counted codes and themes)
• Two types of data do not address the same question	• Where possible the same questions have been addressed in both qualitative and quantitative approaches
• Incorrect or biased interpretation of data	• Member checking – all interviewed participants were invited to review typed transcripts of their interviews; four participants were sent copies of emerging theory for their confirmation.

In this study the researcher sought to address any potential threat to interpretation of data through constant contact with both supervisors, and through the data analysis being overseen and reviewed by both supervisors. In addition, preliminary findings were presented for discussion to members of the Gifted and Talented Education National Advisory Board, a group established by the Ministry of Education in 1997. Attendees discussed degrees of giftedness that they suggested may relate to the number of subjects in which students obtained a Scholarship. The researcher chose not to include this aspect in the study as her approach to this project came through her understanding that the Ministry of Education had identified this group of students

that most would consider represents gifted and talented students and who were "within a range of 2% to 3% of the cohort in each subject" (Ministry of Education, 2005, p. 3). This identification of 2 – 3% is consistent with international literature (Gagné, 2003; Renzulli, 2002). There was also discussion centering on data that suggested a link between school decile and student success. The researcher had put forward the proposition: That school status is predictive of student achievement. This elicited comment that centred on whether it is school status that impacts on achievement, or teacher efficacy. This concept was discussed with the researcher's supervisors and it was decided to investigate further through revisiting the survey and interview data which at that stage, had not been fully analysed quantitatively.

Validity was also achieved through the selection of an appropriate (purposive) sample and through the choice of data collection instruments. As already discussed, the majority of students who participated in the Pilot Study came from high decile schools (n = 33 of 48), a smaller number from mid decile schools (n = 12 of 48) and fewer from low decile schools (n = 3 of 48). It was deemed important therefore to gain a purposive sample that included greater representation from mid and low decile schools so the subsequent study was designed to remedy this limitation (see Table 4).

Minimising the time between engagement with data collection tools and ensuring the instruments matched the respondents' time span were considerations in the Scholarship research. Interviews were conducted in the months immediately following the collection of data in the on-line surveys. In this research, validity is determined by the extent to which the emerged theory is supported by the data that were gathered. Validity of the interviews and survey data is evident where there is agreement between students' perceptions towards an item in the survey and the opinions they expressed in interviews. In addition, the extent to which the qualitative data compares with those gained quantitatively can also assist in validity. Variables that may influence data may also influence the validity of the study and these would include the extent to which the research interests the students and the extent to which students believe they were influenced in their Scholarship success.

The Challenge of the Literature Review

Providing a review of literature pertaining to the topic proved something of a dilemma. Acting on the advice of Glaser and Strauss (1967) who advocate delaying

the literature review in order to allow the discovery of previously unfound theories, the researcher's knowledge pertaining to the education of gifted and talented students and her understanding of NZQA Scholarship enabled her to design the study with only scant attention to literature prior to data collection and analyses. In the early stage this literature enabled the development and appropriation of survey instruments that related to potential areas of interest pertaining to NZQA Scholarship and student perceptions of those factors that facilitated their success. Thus, a full and rich investigation of literature pertaining to the emerged theory was conducted following completion of data analyses and the development of theoretical propositions. It can be said therefore, that the researcher entered this project with an open mind and willingness to pursue theory as it emerged, without the constraints of a prewritten literature review underpinning the findings.

Summary

To summarise, this study has used a purposive and theoretical sample of students who gained NZQA Scholarship to investigate the factors they perceive as having facilitated their success. A mixed method approach has been taken in data gathering and analysis enabling both qualitative and quantitative data to inform the results. Triangulation has occurred across and between the data which have either been entered into SPSS for analysis or coded according to grounded theory.

In the next chapter the project findings are considered and a selection of student interview comments and statements from the on-line survey are provided as examples of responses to open-ended survey questions. In addition, quantitative data are analysed and integrated with the qualitative findings.

CHAPTER 5
Findings and Interpretation

Before introducing the findings, this chapter will provide an overview of descriptive data gained from student self-reports. The chapter will present and interpret the findings of this study of NZQA Scholarship recipients in addition to considering the data and their ability to address each of the research questions.

Descriptive Information

The participants

As had occurred in the Pilot Study, the largest number of participants came from quintile 5 schools (n = 145). However, as one could expect in a larger sample, the overall number of students in each quintile increased. In comparison to the pilot, there were more participants from quintile 1 schools (n = 6), quintile 2 schools (n = 28), quintile 3 schools (n = 55) and quintile 4 schools (n = 96) in comparison to Study One. Two students whose school quintile was 'missing' were both students who cited universities as their school. Of the total number of students participating in this survey (N = 332), 40% (n = 134) were male and 59% (n = 198) were female.

NCEA endorsements

Student responses to the question asking whether or not their certificate had received an endorsement are shown in Table 5. Percentages have been calculated from all students (N = 332), and percentages and numbers of students who did not respond to this question have been included in column one. More students received an endorsement in Level 3 in Merit or Excellence than in Level 2. It is possible that students were unaware that the endorsements introduced in 2007 would be awarded retrospectively for earlier certificate levels. It is also worth noting that not all students in this study had yet sat Level 2 or Level 3 as some successful Scholarship students were in Year 11 and others were in Year 12.

Table 5: Student self-reports of 2007 NCEA 'Merit' and 'Excellence' endorsement data

	Did not respond		Merit		Excellence	
Level 2	47.2%	(157)	18%	(60)	34.6%	(115)
Level 3	18.3%	(61)	37.9%	(126)	43.6%	(145)
Difference between L2 & L3	- 29.9%	(96)	+ 19.9 %	(66)	+ 9%	(30)

Award types

All students responded to the question that asked them to name the type of Scholarship award they had received. The total number (n = 402) of awards indicated is greater than the number of students in the survey (N = 332) as some students received more than one award. Students were asked to specify the type of award they gained. Their responses were: Single Subject Awards (n = 230), Top Subject Award (n = 19), Scholarship Award (n = 116), Outstanding Scholar Award (n = 31) and Premier Awards (n = 6).

Award subjects

To preserve participant anonymity, some responses to this section required aggregation before reporting them in a table. This was due to the low numbers of Scholarships gained overall in some subjects corresponding to the low number of students successful in those subjects who were also participants in this research. It is possible that if the numbers had been reported, some participants successful in gaining a Scholarship in a language (Chinese, French, German Japanese, Latin, Spanish, and Te Reo Māori) could have been identified in this study.

Males gained more Scholarships than females in mathematics (mathematics with calculus, statistics and modelling) and science (biology, chemistry, physics and science) with 156 Scholarships being gained by males, and 119 Scholarships gained by females in these subjects. This trend was reversed for the humanities (English, history, all languages, media studies and drama) with 134 Scholarships gained in these subjects by females, and 58 Scholarships gained by males studying humanities. These gender patterns roughly parallel those reported nationally (National Qualification Framework statistics, 2007, p. 1). Table 6 provides the percentage of Scholarships awarded to students in this research who gained Scholarship in the aggregated maths and science, or the humanities.

Table 6: Percentage of awards by gender

	Maths and Science	Humanities
Awards to Males	56.7%	30.2%
Awards to Females	43.2%	69.7%

Decision to attempt scholarship

Most students said they made the decision to sit NZQA Scholarship in Term One 2007 (n = 121). The second greatest number of students (n = 105) said they decided to attempt Scholarship during 2006 (i.e. the previous year). Other decisions to sit were made by students in Term 2 2007 (n = 66), Term 3 2007 (n = 29) and 'other' (n = 21). There were no patterns evidenced in students' other decision-making timing, as these comments show:

> Term four of the year I sat Scholarship. (Female, q3, 2008 survey)
>
> 2 years before the exam. (Male, q5, 2008 survey)
>
> When I heard it was free to enter – can't really remember when. (Male, q5, 2008 survey)
>
> Decided to do Scholarship History in Year 10 or Year 11. (Female, q4, 2008 survey)

Hours spent studying (N = 329)

Most students in this survey reported they spent up to 5 hours per week (n = 179) or between 5 and 10 hours (n = 98) during study leave preparing for Scholarship examinations. Of those students who reported studying more than 20 hours a week (n = 39), 18 gained a Single Subject Award, ten gained Scholarship Awards, two gained Top Subject Awards, eight gained Outstanding Scholar Awards, and one gained a Premier Award.

Through the application of a filter to statistical data gathered in Survey Monkey, it was possible to look for patterns relating to students gaining the ultimate Scholarship Award – the Premier Award – and the number of hours studied during study leave. It appears that those students who gained Premier Awards studied for up to 5 hours per week (n = 2), between 5 and 10 hours (n = 2), between 10 and 20 hours (n = 1), with one student studying for more than 20 hours per week during study leave. These data suggested no obvious relationship between gaining the ultimate Scholarship Award – the Premier Award – and time they reported spending on study during study leave in comparison to other students.

Future choices

Students were asked to describe what they would do now that they had attained Scholarship. Student responses (n=316) are shown in a Figure 4.

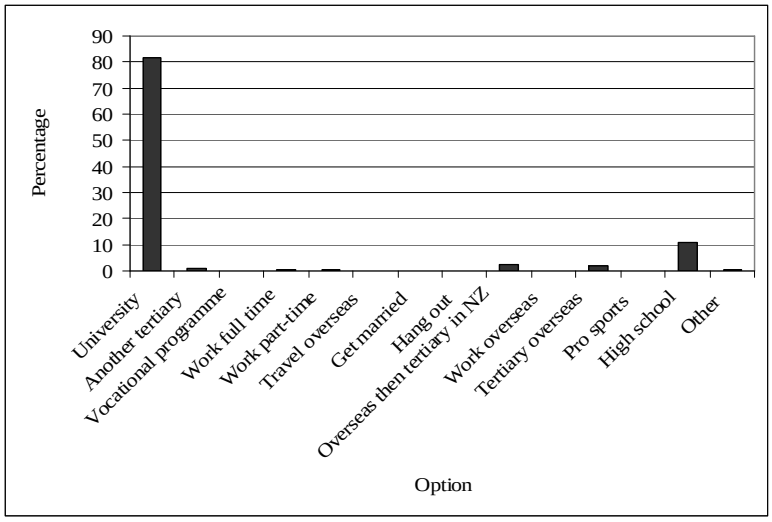

Figure 4: ***Student choices for 2008***

As Figure 4 shows, on leaving school most students (81.6%) chose to go to university. There were also a number of students (10. 7%) who were returning to high school to complete Year 12 or 13. These students had indicated that they were younger (in Year 11 or 12) having taken one or more Scholarship exam in subjects in which they had enrolled early. Of those students heading to university, many were aware of what they wanted to study at university:

> …if things go to plan I'll finish my undergrad degree next year...then I may do Masters or a PhD. (Andrew, q3, 2008 interview)

> A Bachelor of Arts with Art History. ..I'm actually ...after this year I'm going to apply for architecture I think. (Lauren, q2, 2008 interview)

> I'm thinking I might complete my undergraduate stuff and I'm looking at maybe getting some work experience before going on to post-graduate stuff. (Mick, q3, 2008 interview)

> I want to actually do my PhD over in [country]. I don't know whether I'm going to go into teaching for a while and go back and do my PhD or trying to...I'm not going to limit myself to just a bachelors [degree] I'm going to keep going. (Miles, q1, 2008 interview)

Students who were interviewed gave their reasons for choosing to go to university:

> I think I just always knew I was going to go to university… (Amy, q2, 2008 interview)

> I'd always wanted to go to university...in my final year I decided on the actual decision of what [subjects] I wanted to do. (Molly, q3, 2008 interview)

For some students, these reasons appeared to relate to family or parental expectations:

> Well I'm Asian and university is pretty much compulsory for us. (Lauren, q2, 2008 interview)
>
> Ever since Year 9 I've been tailoring my education towards university just because within my family it's something that we all have done. (Drew, q3, 2008 interview)
>
> It [university] was always expected of me …My parents – mainly my mother. (Becky, q4, 2008 interview)

The Research Questions

Question 1: To what factors do students attribute their success in attaining Scholarship?

This question was addressed in both the on-line survey and the student interviews. However, rather than being able to identify one enabling factor it appeared that there were many factors to which students attributed their Scholarship success, and these factors linked to one core code. This code was identified in student self-reports and each interview, and related to the students' Scholarship teacher. These teachers were identified by students as both the single greatest *overall* influence and as the *person* who had the greatest influence on their Scholarship results.

My scholarship teacher

Students in this study ranked their teacher as the person of greatest influence in their Scholarship success (See Figure 5) citing a number of reasons for this choice that included personality and professional qualities. As the existing literature has not defined what constituted professional or personal characteristics, those attributes labelled either professional characteristics or personal characteristics are based on the researcher's judgement. Some characteristics could be considered as either professional or personal depending on the perspective of the reader.

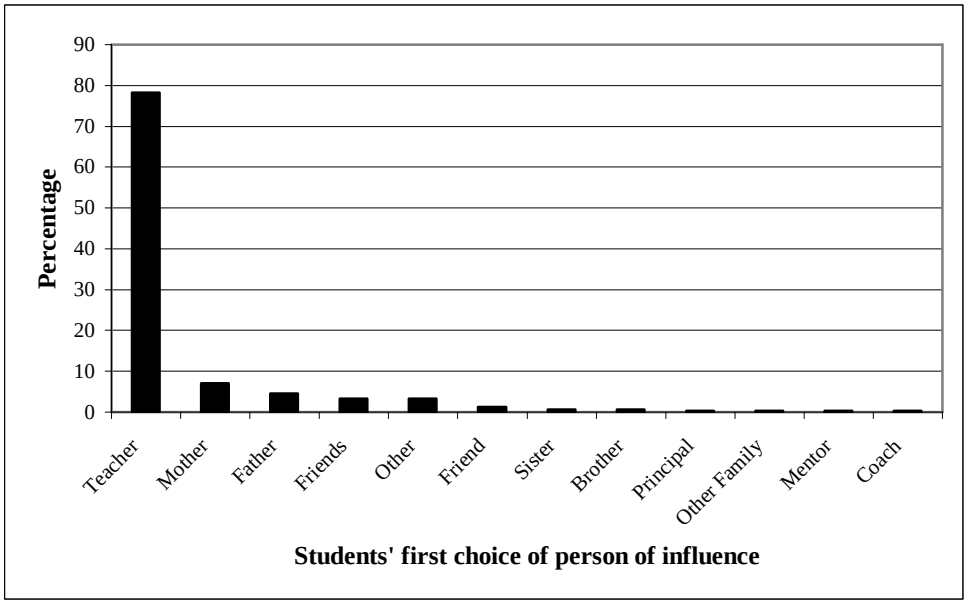

Figure 5: ***Student rankings of the person who was the greatest overall influence in their success***
(People of Influence (N= 327)

In addition to selecting 'teacher(s)' as the person whom they perceived as having the greatest influence on their Scholarship results, students chose 'mother' as the second ranked person and 'father' as the third. Student comments defining 'Other' included: God-Jesus, myself (n = 8), one of my competitors, teachers outside of my school, girlfriend, boyfriend, grandfather (n = 3), uncle, violin or singing teacher, my role model (not specified who this was), authors or artists of set texts, stepfather, scholarship tutor, Kapa Haka tutor, study group, and, classmates who were not necessarily friends. With the exception of 'myself' and 'grandfather' none of these other influences were named more than twice.

Perceived greatest overall influence

When calculated as a percentage of all responses, it was obvious that students perceived that the greatest *single* influence was their teacher (29.5%). Intrapersonal factors were also considered to have contributed to students' success with ability and interest and enthusiasm each gaining 20.6% of student responses. These data and the other perceived greatest overall influences are displayed in Figure 6.

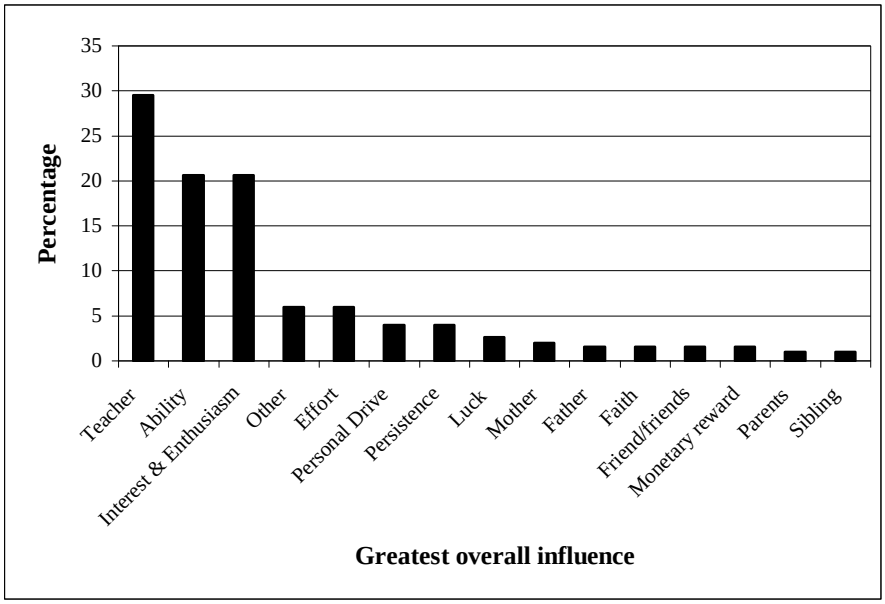

Figure 6: ***Students' perceived overall greatest influence in their success***

Professional qualities

During interviews and in on-line survey comments, students spoke of the perceived importance of making a connection with at least one teacher. They believed that teacher-student connections were important factors in facilitating student success as this relationship enabled them to gain confidence in their own ability:

> I think student and teacher connections are probably one of the things that most schools totally forget about. They are more focussed on the academic type thing, whereas me, for students like me, it doesn't matter about academic success or whatever, it matters that I make a connection with whoever is giving the information. (Myles, q1, 2008 interview)

It was apparent that students perceived that those teachers who had inspired them engendered a feeling of loyalty, with their students not wanting to 'let them down'. Students believed they had prepared for the examination with this as a focus:

> [The teacher] – he was extremely enthusiastic about the subject and had very high hopes that I would get scholarship. This made me work harder so that I could meet his expectations. (Female, q4, 2008 survey)

These teachers believed in their students' success, which led to student self-belief and ultimately, success in Scholarship:

> It was my teacher who insisted I had the required qualities and ability to sit the exam. If my teacher had not insisted I sit the exam I would not have attempted it. (Male, q2, 2008 survey)

> ...knowing that a teacher thinks that you can do it is enough motivation to work hard to get it. (Female, q5, 2008 survey)

The idea of teachers providing the impetus for students to attempt Scholarship was also supported by one of the two teachers who were interviewed:

> …I say to the ones in my own class, "I think you should have a go" and I say "well I suggest you have a go because I wouldn't ask you if I didn't think you should have a go at it." (Julia, teacher, 2008 interview)

Students also valued teachers who were knowledgeable about their subject and the NCEA, citing examples of where teacher knowledge had enabled teachers to predict what was in the Scholarship exams:

> …she knew the NCEA system really well, like – she could basically predict which questions would come up and help us study specifically for those questions. (Jane, q2, 2008 interview)

Those teachers students described as facilitators of their success were most often the teacher in whose subject the student was successful. However, this was not always true, as Theo discusses:

> There are definitely certain teachers who've encouraged me a lot to continue down the path I've been going and to go ahead with my schooling ... None of them have taught me Scholarship…. (Theo, q3, 2008 interview)

Many of the students in this survey perceived that the classes in which they had gained Scholarship were well organised, that the teacher provided opportunities for discussion and interaction between students and the teacher, and that students collectively aimed to achieve at the highest level:

> The classroom was one where all the students wanted to do really well. Two thirds of this class ended up with Scholarship. The teaching was aimed at a high level – we had lots of discussion and interactions. The teacher really helped with that by making lots of resources available to us...heaps of exams that had been marked...we could write practice essay – she made lots of options [available] for us. (Jono, q5, 2008 interview)

> …participation was encouraged no matter what level of school it was. In some ways...it's kind of competitive but not. People always wanted to put in their 10 cents no matter what they thought. (Becky, q4, 2008 interview)

Students also commented on the value of having the school hold additional classes that were specifically targeted at assisting students to prepare for Scholarship. It appeared that these classes were held with varying frequency, either weekly, monthly or several times throughout the year. In some schools they were held for a range of subjects, at other schools they offered support in just one subject. These classes were time-tabled during in-school and out-of-school times, with some students experiencing Scholarship classes in the school holidays or the evenings. Molly provides a typical response:

> Once every week...during exam week it was once every few days...before school, and when people had exams we had them [Scholarship meetings] when she [the teacher] would have had a class. (Molly, q3, 2008 interview)

Quite a few of these classes were held during what is traditionally teachers' non-contact time:

> …our [subject] teacher had weekly Scholarship [subject] questions available. She'd go thru them and all that kind of stuff, every Wednesday lunchtime. (Andrew, q3, 2008 interview)

> …my History teachers set up a study thing in the holidays and those were really helpful. (Antony, q3, 2008 survey)

There were additional variations in these classes, including when they were first introduced each year, the length of time they continued throughout the year, whether they were dependent on one teacher, a team, a department or a whole school approach, or whether they were part of a combined schools' approach. One of the teachers who was interviewed explained how she promoted Scholarship classes amongst her departmental staff, building capability by encouraging members of her department to deliver a Scholarship seminar:

> …to invite them [department staff] to deliver a seminar in front of their colleagues and students. So what they then did was, they spent hours – you have no idea how many hours they spent preparing this thing. They had to cover … in one lunch time. It had to be your 'top notch delivery' …What it has meant is that it has increased 200 fold the teachers' performance in terms of what they can do inside their classroom. And my highlight I think is that each time I've taken on a new Year 13 teacher to teach Year 13, they have taught a student who has got Scholarship. (Julia teacher, 2008 interview)

Student comments about their Scholarship teachers included identification of pedagogical practices that students perceived as facilitating learning and understanding. These practices included the provision of on-going feedback that provided affirmation of what students were doing well or suggested areas where they could improve:

> They told us what was wrong and how to do better. (Daisy, q3, 2008 interview)

> … And she gave constructive criticism which is very successful and she'd give me one on one tutoring whenever I needed it for a couple of weeks before Scholarship I'd go to her and we'd sit down for like 2 hours on weekends and go just over questions and how you can structure answers and I'd write practice essays to give to her and stuff and she'd go over them in her own time. Just putting in that extra yard… (Jane, q2, 2008 interview)

Other pedagogical approaches students described included facilitation of class discussions; making links to authentic contexts; and, teaching exam strategy:

> It was more fluid [than taking structured turns]. She was really good at just adding her opinion – like she was a member of the class, she was in the room, she had an opinion... We felt quite free to either argue against her opinion or agree with her with supporting examples…and she could say "yeah, you can say this but you need an example" and she would often stop us and ask – "where's the example to support this statement?" Especially if someone said something really good she'd say "what's the quote that supports this and how can we justify this answer?" (Drew, q3, 2008 interview)

> He made the subject interesting and made me feel enthusiastic about it which made me enjoy it and think about [subject] in everyday situations which made me understand it better and therefore get better results. (Female, q5, 2008 survey)

> So you'd get the history that you needed to learn but he'd always be making it interesting and telling stories because he'd lived through most of the stuff we'd be talking about. So he'd be throwing in stories of how he perceived it and things like that, and stories from his own life as well which made the periods interesting and gave it a bit of relevance. (Theo, q3, 2008 interview)

> We had special Scholarship classes, where we were taught technique for answering questions, how to plan answers. Planning it out and stuff. (Daisy, q3, 2008 interview)

Student recognition of the explicit teaching of exam strategy was probed and further explained during one teacher interview:

> I target what I call sensible exam skills. In other words, what you do if you are desperate and you can't think: so that's just your very old fashioned strategy – plot setting character style structure and themes and you double your questions, 'cos it's your panic mode. And the other thing is to work out your questions, how many paragraphs you've got to write how long, you've got to write. (Julia, teacher 2008 interview)

Finally, it appeared important to these students that they perceived their teachers as having high expectations for students' success:

> …And the stuff that he teaches he goes over a lot of excellence type questions because that's what he expects we'll get sort of thing. (Susie, q2, 2008 interview)

Positive personality characteristics

It was apparent that the climate students recognised as conducive to learning was based on a number of personality traits that they identified in some of their teachers. These included identifying and then describing teachers who were passionate about their subject, who shared their enthusiasm and enjoyment for their subject that, in turn, engendered the same emotions in their students:

> I was lucky enough to have an amazing teacher in 6th and 7th form. [Teacher's name] was enthusiastic, passionate, supportive, intelligent, perceptive, and inspired me to do well in the subject. She had a unique ability to make learning fun, and make her students determined to achieve. (Female, q5, 2008 survey)

These high-ability students perceived that having a teacher take a personal interest in them facilitated their success:

> She mentored me and took a personal interest in my successes, and also ensured me I was capable of these successes. I always received extra tuition and help when I asked. (Female, q4, 2008 survey)

as did a classroom climate that enabled students and staff to share humour, a concept acknowledged by one of the teachers:

> ...the classroom should be a place of dialogue – and especially at Year 13 level. I suppose I try through humour, through accepting everything that's offered, to cajoling as well at times, you have to do that – and perhaps in a sense letting them see they are equals in the room and that I'm there more as a facilitator than an expert. (Tony, teacher 2008 interview)

There were students who felt supported by their teachers even during the post-exam period, as these teachers maintained or re-established contact with the students to congratulate them on their Scholarship success:

> …when I was working at [store name] during the summer months I saw my [subject] teacher she came in and she came over and congratulated me. (Myles, q1, 2008 interview)

> She emailed me, well done and stuff and we were going to meet up for coffee. (Molly, q3, 2008 survey)

Students were aware that as they progressed through high school their relationship with some of their teachers changed, and by the time they sat Scholarship they perceived that they were being treated by those teachers more as equal partners in the learning process:

> She got the students involved in classes, she treated us more as equals whereas some of the other teachers would just lecture down to us and not get us very involved. (Jane, q2, 2008 interview)

A number of themes emerged during analyses of findings pertaining to students and their teachers, and these required further investigation through statistical testing. In addition to providing triangulation across data, this testing was conducted to determine whether there were significant relationships between students' perceptions of aspects of Scholarship and students' perceptions of their teachers' role in their success. Hypotheses were tested based on the codes and trends that emerged from the qualitative data. These results are displayed in Table 7 and show a positive correlation between students' perceptions of their teachers being supportive of their study (Teacher) and their students' perception that their teachers expected them to achieve Scholarship success (Expect). Students' perception of their teacher being

supportive of their study (Teacher) and their teacher being knowledgeable in the subjects in which they gained Scholarship (Knowledge), were significantly positively correlated. Further correlation was identified between students' perception that their teachers expected them to achieve Scholarship success (Expect) and, during the year in which they sat Scholarship, that their teachers thought they were strong students academically (Strong).

Table 7: Correlation pertaining to students' perceptions of support

Variables		Pearson correlation	% of variation in common
Teacher	Expect	$r_p = 0.295$**	8.7
Teacher	Knowledge	$r_p = 0.328$**	10.7
Expect	Strong	$r_p = 0.257$**	6.6
Family	Parents	$r_p = 0.151$*	2.2
Family	Culture	$r_p = 0.150$*	2.2

* $p < .01$ ** $p < .001$

Clearly, the identified relationship between Teacher and Knowledge required further investigation, leading to the formulation of the following hypothesis: Is there an association between students' gender and students' perception of a teacher being knowledgeable? The hypothesis of null association between students' perception of their teachers being knowledgeable and student gender received support from the data: $H_0 = \chi^2$ (1, N=319) = 3.765, p = .052. That is, student gender was not associated with students' perceptions of their teacher being knowledgeable. However, further consideration of the students' perception of teacher knowledge was possible through statistical aggregation using SPSS. As Table 8 shows, most students (96%) perceived that each of the statements relating to their teachers and Scholarship were sometimes, or always, true.

Any further hypotheses testing based on data emerging from the qualitative comments and students' perceptions of teacher knowledge and expectations and student gender were not possible. This was because one or more of the cells required for the analysis had an expected count of less than five.

Table 8: Student perceptions about their Scholarship teacher

Student perception:	Not at all true/mostly not true	Always true/ sometimes true
My teachers were knowledgeable in the subjects in which I gained Scholarship.	4 %	96 %
My teachers expected me to succeed in Scholarship.	8.3%	91.7%
My teachers were supportive of my study for Scholarship.	4 %	96 %

Family

> My mother kept me calm when I was stressed and my dad just told me to pull my head in but that was what I needed. (Female, q4, 2008 survey)

Most students perceived a parent or parents to be supportive of their study for Scholarship and described several variations of this support. The on-line survey asked students to consider whether their family was supportive of their study for Scholarship. Most students (96%, 315 of 327) believed this statement was sometimes or always true, with 78.9% of these students saying it was always true. The remaining 3.7% (12 of 327) of students believed it was mostly not true or not at all true that their family was supportive of their study for Scholarship.

Students reported that this support included encouraging them to do their best, establishing an environment conducive to study, showing interest and providing oral encouragement.

> My parents … have always encouraged me in everything I do, but have not pushed me too hard, i.e. beyond my limits, so I still maintained the interest and enjoyment in the subjects…. (Male, q5, 2008 survey)

It was evident that a number of parents had tertiary qualifications that assisted them in supporting students in their study:

> She's [my mother] a biologist… (Daisy, q3, 2008 interview)
>
> …my dad has a [degree] in [subject area], and my mum has Honours in [degree name]. And my grandma also has a degree. (Drew, q3, 2008 interview)
>
> My dad is an engineer so he could always help me with [subject names] and stuff. (Jane, q2, 2008 interview)
>
> …both of them [my parents] have graduated with [degrees]… (Theo, q3, 2008 interview)

Yet despite this evidence of parents having tertiary qualifications, students perceived that there were specific roles assigned in relation to students' study. Some students perceived fathers assisted with specific content or NCEA knowledge:

> My step father encouraged me to study lots… He knows enough about physics to take the question seriously. (Andrew, q3, 2008 interview)
>
> My father because he made sure that I had a good understanding of math ever since a very young age, which led to my success today. (Female, q5, 2008 survey)
>
> Dad knew the NCEA system and he wanted me to do well. (Neil, q3, 2007 interview)
>
> Mainly dad's support really, and that's where a lot of my general [subject] knowledge came from – him being a [subject] teacher and now a [name] lecturer. (Sean, q4, 2008 interview)

Interestingly, students were more likely to credit their mothers with positive oral encouragement and the creation of an environment that was conducive to study:

> Just asking how my day had gone. Asking if there was anything she could do to help me study…. (Jane, q2, 2008 interview)
>
> My mother … really believed in me so I had a positive attitude and I attempted the exams even though I wasn't sure if I was able to achieve Scholarship. (Female, q5, 2008 survey)
>
> …she [my mother] was the person I would talk to… and help me with actually studying and that sort of stuff and just sort of more motivation when I didn't really feel like studying…. (Steve, q3, 2008 interview)

Following analyses of qualitative comments pertaining to students and their families, the quantitative data were used to triangulate between sources, and were tested for any statistical association. The hypothesis relating students' gender and students' perception of family support could not be tested because one or more of the cells had an expected count of less than five. Hypotheses between other factors in the survey pertaining to student and families or parents, and students' gender could be tested, and the results are presented in Table 9.

Table 9: Statistical testing for association between students' gender and factors

Null Hypothesis	Factors
$H_0 = \chi^2$ (1, N=324) = 0.348	Parents
$H_0 = \chi^2$ (1, N=320) = 1.71	Culture

There was no relationship between students' perception of their parents expecting them to be successful in Scholarship (Parents) and gender: χ^2 (1, N=324) = 0.348, p = .555 (see Table 9). That is, the perception that their parents expected them to be successful was not related to student gender.

As Table 7 shows, a statistically significant positive correlation was found between students' perception of their family being supportive of their study (Family) and their parents expecting them to achieve success in Scholarship (Parents) (r_p = 0.151, p = 0.006) (see Table 7), although this correlation was low. The proportion of variances shared by family support and parental expectation is about 2.2%. Further consideration was given to investigating students' perceptions of family support in relation to student gender. Table 10 shows that there is little difference between the perceptions of male students and female students in relation to family support and expectations of success. Clearly, most students in this survey perceived that their family was supportive of their study for Scholarship (96%) that their parent(s) held expectations that the student would be successful (75%).

Table 10: Student perceptions of support pertaining to their family

Student perception	Not at all true/mostly not true		Always true/ sometimes true	
	Male	**Female**	**Male**	**Female**
My family are supportive of my study for Scholarship.	4.0%	3.0%	96%	96.9%
My parents expected me to achieve Scholarship.	23%	26%	76.7%	73.8%
The subjects I gained success in are subjects that are valued in my culture.	42.8%	35.5%	57%	64.4%

Comments from some students suggested they were motivated to achieve as a result of a perceived disadvantage occurring through their family's heritage, such that Scholarship provided an opportunity not afforded to older family members:

> My granddad came from [an overseas country] and my family came from [country] and we weren't entitled to any education over there. Um...but I did it for his honour really to take advantage of this opportunity that I was actually given and you know, contrasted with what he was given and that was **nothing**. I did Scholarship, I didn't have to pay for it, I thought I had quite a high chance of getting it so I went ahead and did it, just like he told me. (Myles, q1, 2008 interview)

The idea of expectations for success relating to a student's ethnicity was evident in the perception of some students who reported they were of Asian descent. Declarations of ethnicity had not been components of either the on-line survey or interviews. However, it seemed that some students perceived that Asian families expect their sons and daughters to perform extraordinarily well:

> First off, my family and my cultural background because I'm Asian and there's pressure there to do well. (Susie, q2, 2008 interview)

> Our parents coming from a quite traditional country in a way – academic standards are really high. So going to university is not a choice. You have to go right after college...as well as our career options you had to choose, I had to choose mine in the 5th form. That's how much my parents expect of me…. (Lucy, q3, 2008 interview)

The hypothesis of null association between students' perception that the subject or subjects in which they gained Scholarship were valued in their culture (Culture) and students' gender received support from the data: χ^2 (1, N=320) = 1.71, p = .190. That is, there was no identified association between students' gender and their perception that the subjects in which they gained Scholarship were valued in their culture. A positive correlation was found between students' perception of their family being supportive of their study for Scholarship (Family) and students' perceiving the subjects in which they gained Scholarship being valued in their culture (Culture) (r_p = 0.150, p < .01). This indicates that family support and subjects being valued in the students' culture in this sample share 0.2% of their variation in common. Further scrutiny of data pertaining to students' perception of the subjects in which they were successful being valued in their culture and students' gender (see Table 10) showed that female and male students were fairly equally divided on whether or not this statement was not at all or mostly not true, or, sometimes or always true, with 57% of males and 64% of females agreeing with the statement.

Finally, some students commented that their parental expectations for success could be considered to be a form of pressure, though this was not necessarily negative:

> Well if I got a Merit in something he [my father] would be supportive and that but he'd ask why I didn't get an Excellence and there'd always be an expectation that I could do better and I should do better… Mothers are more supportive. I think that's why the pressure didn't get to me. My mum was always there, happy with whatever I got, sort of thing. They equaled each other out quite nicely. (Jane, q2, 2008 interview)

My friends and peers

Few students (n = 5) perceived their friends or peers to have been the greatest influence in their success. It was apparent that students perceived friends and peers as *part* of the Scholarship process, but not the most important part. Friends and peers provided competition and support for students, especially in schools where the students were grouped with others who were also aiming for Scholarship success:

> Well, my friends were probably my biggest competition and we were very competitive so that was probably our motivation to do better and we wanted everybody to do well. And also, we all wanted each other to do well because we all wanted to go to uni together, that kind of stuff. So it was kind of a motivation to keep up with everybody else and make sure everybody was doing well and we did different study classes together and stuff. (Steve, q3, 2008 interview)

> …Maybe not friends, but peers encouraged me to take up Scholarship. (Becky, q4, 2008 interview)

Students also commented on their perceived importance of having like-minded peers who were similarly successful:

> I noticed friends with whom I could discuss ideas extensively and freely, each of us challenging the other, tended to be more comfortable with Scholarship material and tended to succeed in Scholarship too. (Male, q2, 2008 survey)

Faith

A small number of students (n = 3) claimed their success in Scholarship was due to their belief in God:

> My faith – the fact that I wasn't doing it for myself but for God, it helped me give my all and took away a lot of the pressure to do well (since I wasn't really doing it for myself). (Female, q5, 2008 survey)

Intrapersonal factors

Intrapersonal factors are student personal beliefs and characteristics students hold about those factors that influence their motivation. Triangulation between data sources (student interviews, on-line survey qualitative comments and quantitative data) affirmed what these sources had suggested, namely that a number of students in this study perceived their success in NZQA Scholarship was, amongst other things including their teacher, attributable to their ability (20.6%), effort (5.8%), interest and enthusiasm (20.6%), persistence (4%) or luck (2.4%). Based on these findings hypotheses were developed to look for association between each of those factors (ability, interest, effort, persistence and luck) and the student's gender. As Table 11 shows, three of the hypotheses relating to intrapersonal factors received no support from the data.

Table 11: Statistical testing for association between students' gender and factors

Null Hypothesis	Factors
$H_0 = \chi^2$ (1, N=318) = 1.75	Ability
$H_0 = \chi^2$ (1, N=325) = .475	Effort
$H_0 = \chi^2$ (1, N=327) = 8.48**	Interest and Enthusiasm
$H_0 = \chi^2$ (1, N=325) = 8.13**	Persistence
$H_0 = \chi^2$ (1, N=328) = 5.48*	Luck

* $p < .01$ ** $p < .001$

This suggested that there was an association between Interest and Enthusiasm and Gender; Persistence and Gender; and, Luck and Gender. The remaining two factors – Ability and Effort – were not related to student gender. These results and those pertaining to the other intrapersonal factors are discussed further in the following sections.

Ability

Students who claimed their ability to be the greatest overall influencing factor in their success perceived that a number of factors had combined to make them successful Scholarship students. These factors included prior knowledge, an easy grasp of concepts, belief and confidence in their own ability, a connection between being 'good' in a subject and finding it easy, enjoying study and having an understanding of the way they believed the examiners were looking for them to respond. These students made specific mention of the ease with which they grasped concepts and of their natural ability to understand even complex material:

> My natural ability in the subject. I found the subject easy therefore was able to grasp concepts quickly and fully understand ideas that were presented. This I largely put down to my father as we often have intellectual discussions on the subjects I got scholarship in. (Male, q4, 2008 survey)

For some, this ability meant they believed they had not needed to study, suggesting that some high-achievers were underachieving:

> My ability to grasp concepts quick meant I rarely studied as I could already achieve adequately without so there was no real point to it.… (Male, q4, 2008 survey)

Students perceived that this, coupled with having chosen the 'right' subjects in addition to the more than adequate internal marks they gained in NCEA, had provided them with the confidence to believe they would achieve:

> I knew I was capable of achieving at the highest level in history because of my past results and my teachers' encouragement of me doing scholarship. I knew that if I put the work in the ability was already there and I just had to build on it. (Female, q4, 2008 survey)

Other students felt that their ability was such that the Scholarship exams were easy. Knowing what it was the examiners were 'looking for' had facilitated their success:

> Whilst I do believe I am very able in my Scholarship subjects, I feel that superior to that is my ability to do well in exams. If you can say what you know the examiners want to hear, you will always be successful. (Male, q5, 2008)

Student enjoyment of particular subjects was perceived as another factor that influenced their ability:

> Ability in subject – arts subjects just come easily to me so I didn't find scholarship overly challenging, rather quite enjoyable and interesting. (Female, q5, 2008 survey)

When the intrapersonal factor 'ability' was tested, the hypothesis of no association between students' perceived ability in the subject and students' gender received support from the data: χ^2 (1, N=318) = 1.75, p = .185, which suggests there was no association between students' perception of their ability and students' gender.

Of those students who claimed ability was the greatest influence in their successful results, 93.6% (64 of 67) also chose 'teacher' as the *person* of greatest influence. This filtering of responses produced a result that is at odds with the perception of students who identified their ability as the greatest overall influence. Few (3 of 67) of these students mentioned their teachers or the role they may have played in developing or furthering their ability, claiming that ability was an isolated, personal factor that had facilitated their success:

> Ability (duh). If I can't do well in a subject, there's no point in trying to attain scholarship, thus I only sat scholarship for the subjects I did well in throughout the year. (Male, q5, 2008 survey)

> The greatest overall influence is yourself and your own attitude towards the subject. Noone else is gonna do it for you. (Female, q4, 2008 survey)

Effort

There were variations in the amount of effort some students perceived they had put into their Scholarship preparation. Some believed it had been a sustained effort over a number of years:

> Effort – it would be the cumulative effort of all my years of high school, that built up the skill required to undertake the scholarship exams successfully. (Male, q5, 2008 survey)

while others suggested they had 'picked up' a subject in Year 13 and had needed to put in a great deal of additional effort that year in order to be successful.

Student comments across both the interviews and the on-line survey suggested that some students had elected to plan their study time for Scholarship, choosing to study intensely and often:

> …Every night after school if I didn't have anything I'd be studying for it on …I'm really glad I got it because I put a lot of work into it….I'd come home and get on the computer and study a subject for an hour, do another subject for an hour, have dinner, go back to my room and study for another hour, then I'd call my girlfriend and then go to bed. Yeah – anything between 5 and 6 hours a day. (Antony, q3, 2008 interview)

Some students spoke of the activities they had put aside in order to study and prepare for Scholarship:

> I gave up a couple of sports. And I went on with music but then I also stopped attending a couple of practices for concerts and stuff to study....pretty much throughout the year… I used to work three days a week, then I only worked one...During exam time I would just take work off – I wouldn't work at all. (Lauren, q2, 2008 interview)

> I gave up activities but not important activities like sport. The activities I really gave up were like TV watching. (Susie, q2, 2008 interview)

As already stated, the null hypothesis χ^2 (1, N=325) = .475, p = .491, received support from the data, suggesting no association between students' perception of their effort and gender.

Interest and enthusiasm

Students spoke of their enjoyment for a particular subject, relating their success in that subject to the interest and enthusiasm they had experienced:

> My high interest in the subject also helped because it meant that I enjoyed the extra study for the exam. (Female, q4, 2008 survey)

> I enjoyed studying and learning about physical education. I read a wide range of material about the subject and I did not find this a chore because I was interested in what I was reading. (Female, q3, 2008 survey)

Students tied their own enthusiasm for a subject to the teacher's enthusiasm for the subject:

> I think that both my own and my teacher's enthusiasm for my subjects played a crucial role in me achieving scholarship. This shared enthusiasm made it considerably easier as studying for the exams was fun and interesting rather than a task… Sharing this enthusiasm with my teachers meant I could relate to them more when learning and therefore over the period of the year my knowledge base gradually expanded so by the time the exams came around I merely had to go over what I knew rather than keep learning. I was confident in what I knew and could perform better with this confidence and enthusiasm. (Female, q4, 2008 survey)

The hypothesis of no association between students' perceived interest and enthusiasm for the subject and students' gender was not supported by the data $H_0 = \chi^2$ (1, N=327) = 8.48, p = .004. Students' perceived interest and enthusiasm for the subject was significantly related to gender, with girls more likely than boys (92% versus 82%) to consider that their interest and enthusiasm for the subject was of some influence or a big factor in their successful results. A further 7.1% of females and 17.5% of males perceived that their interest and enthusiasm had little or no influence on their results.

Persistence

Students described the way their persistence had facilitated their success and included discussion of being strategic in one's approach to examinations:

> Persistence – My strategy is to keep on top of my notes during the year instead of doing them quickly before the exam. That way my notes are of better quality because I am not stressed, I can constantly revise them and time before the exam is spent remembering them instead of writing them. (Male, q3, 2008 survey)

One student expressed the belief that anyone could improve with persistence:

> …Persistence… because you need to have ability to achieve success but anyone can improve their ability through persistence. (Female, q3, 2008 survey)

The hypothesis of no association between students' perception of the role persistence played in their successful results and students' gender was tested and rejected: $H_0 = \chi^2$ (1, N=325) = 8.13, p = .004. There was a 15% difference between male and female perceptions: 31% of males and 46% of females perceived persistence to have little or no influence compared with 68.7% of males and 53% of females who perceived persistence as having a big or some influence on their results. This significant finding suggests that male students perceived persistence as a more important influence in their success than female students did.

Luck

Students who perceived luck as the greatest factor in their success had not believed themselves capable of gaining a Scholarship:

> …the factor that influenced me the most was the luck because when I tried past scholarship papers and other questions in AME book, I couldn't do lot of them and thought it would be impossible to get the scholarship. It turned out that it wasn't as difficult as the past papers (or something like that, can't remember exactly) so I would have to say it was the luck that influenced me the most. (Female, q5, 2008 survey)

There were also students who credited their success to having 'the right' questions in their examination, counting this as luck:

> Luck, in that one of the essay questions in the exam was very, very similar to the topic of my internal assessment for [subject]. (Female, q3, 2008 survey)

The hypothesis of no association between students' perception of the influence of luck, and students' gender was tested and rejected: $H_0 = \chi^2$ (1, N=328) = 5.48, p = .019. This suggests there is an association between students' gender and their perception of luck. Further analysis of these data revealed that 22% of males compared with 35% of females perceived luck to have had some influence or to have been a big factor in their successful results. Of those students who perceived that luck had either no influence or a little influence in their successful results, 64% were female and 77% were male. Overall it would appear that males perceive luck as less of a factor in their results than females (64% to 77%).

Question 2: What patterns can be identified in student backgrounds and school experiences relating to attaining Scholarship?

Data that related to this question were obtained through the on-line self report survey and through student interviews that revealed a range of different experiences in relation to academic pathways and achievement patterns. The type of additional supports and services these students had received varied in availability, frequency and perceived quality.

Enriching and accelerating

Although not all students claimed that they had participated in enrichment programmes or been accelerated in their studies, almost half reported that they had (n = 165). On-line response comments aligned with those given during interviews and suggested that students had participated in the following forms of enrichment and/or

acceleration: some gifted classes at primary or intermediate school; participation in the NCEA ahead of their year group (i.e. in Year 10 they sat Level 1, in Year 11 they sat Level 2, in Year 12 they sat Level 3 and possibly Scholarship); Cambridge exams sat in Year 12 or 13, and, participation in university courses in Year 12 or 13 in addition to their high-school studies. Student comments suggested variation in the quality of these opportunities:

> …and my [Gifted Class] teacher, who actually made it possible for me to sit scholarship from Year 11, despite the timetabling nightmares… (Female, q5, 2008 survey)

> At high school – there was a [gifted] programme in Year 9 and 10 but they didn't do anything – it wasn't well organised. There was class streaming in Years 9 & 10. (Jono, q5, 2008 survey)

> I think this kind of relates to what school you went to. My school doesn't offer anything like that – they work for the less able students and don't offer things for the gifted people. (Molly, q3, 2008 interview)

Students also commented on ability groupings that they perceived as having facilitated a competitive environment:

> …I was in a class at high school called the gifted and talented class and most of the people there…became my friends and they were also the people I competed with for top academic prizes and stuff. I've always been someone who does well with competition and competing does do good things for me…We were all grouped together – all the people who were more likely to gain Scholarship were all grouped together. We were quite competitive about it. (Drew, q3, 2008 interview)

There were patterns in student decision-making in relation to when students made their decision to attempt Scholarship with most students making the decision in Term 1 of the year they sat Scholarship. It is interesting to consider those students who made the decision the year previous to the one in which they sat Scholarship. The reasons students gave for this often related to the way in which Scholarship was promoted within that student's school:

> It's kind of like... at our school it [Scholarship] was done as an extension to English ...it was for fairly able students. You could opt in and opt out. (Andrew, q3, 2008 interview)

Students spoke of former recipients being 'famous' within the school, of seeing an honour roll on the school assembly board, of seeing past students' work and aspiring to have for example, a Scholarship art folder that looked like theirs, or, the prospect of earning a Top Scholar tie. Each of these acknowledgements of past recipients' success appears to have provided an incentive for students to aspire to sit and attain Scholarship in the following year:

> ...in at my school, up in the assembly hall there's a board of all the awards which have been given out... Scholarship past students over the past years. I always look at it whenever [I'm] at assembly. It's always like there in your mind – for me it's kinda like part of my motivation to get my name on the board because then I'd be remembered I guess, so that was something to aim to. (Steve, q3, 2008 interview)

Studying

Patterns were evident in the number of hours students reported studying during study leave with most students indicating they spent up to five hours per week during study week preparing for Scholarship. However, as already stated, there was no evident link identified between the number of hours a student studied and the value of the award they attained.

Extracurricular activities

> Give anything a go. (Male, q3, 2008 survey)

Students were asked to list any activity in which they had been involved in the past three years at high school (these data are available as Appendix F). There were evident patterns in students' activity involvement. With the exception of 11 students who did not respond to the question, all Scholarship students in this survey stated they were involved in an activity or activities for a minimum of between one and five hours each week. Thus the Scholarship recipients in this study were involved in a wide range of sporting, cultural and social activities. Not only did these students *participate* in activities but they also reported leadership and coaching roles. One trend evident in the data related to the increased leadership opportunities schools make available for their Year 13 students (see Table 12).

Table 12: Student involvement across all activities

	Percentage of Year Group Participating in Activities			
Activity	**Year 11**	**Year 12**	**Year 13**	**Difference Between Year 11 and Year 13**
Athletic	86.7	84.3	79.7	- 7%
Clubs	52.5	57.4	67.6	+15.1%
Performance	55.6	56.4	57.8	+ 2.2%
Leadership	27.9	51.5	85.2	+ 57.3%
National/international	14.2	15.9	23.3	+ 9%
Part time work	55.9	65.8	71.5	+ 15.6%
Community	30	37.4	43	+ 13%
Church	29.8	29.2	30.4	+ 0.6%
Other	31.5	38	42.5	+ 11%

One male student quipped that his 'other' activity was:

> Girl friend lol but time consuming. (Male, q3, 2008 survey)

Disappointing teaching

> My [subject] teacher was pretty slack... He doesn't prepare his lessons, he does not set work for us to work …it was really disappointing really. (Lauren, q2, 2008 interview)

Students mentioned inappropriate curricula that left them feeling bored or frustrated. This lack of academic challenge for high-ability students requires further investigation, given student comments that boredom had made it difficult to remain motivated at high school:

> My school was terrible at catering for students who are gifted and talented. Without the support of one of my teachers I would have dropped out because school did not assist me in any way and the system is not designed to cater for students outside the 'norm'. … I felt bored for the past five years in class... (Female, q3, 2008 survey)

Other students commented on the lack of school support for students who aimed for high-achievement:

> [There was] no encouragement of excellence… I don't think they [the school] encourage high achievement, at all. They definitely didn't encourage excellence. ...the school itself had an attitude like, where if you're white, you're rich, you can do Scholarship. If you're Maori, if you're poor you cannot do Scholarship. Since the school has a lot of Māori students, they're really shooting themselves in the foot... (Myles, q1, 2008 interview)

> A lot of the students at our school don't really aim very high, they just aim to pass. So our school puts a lot more focus on just getting 'achieved' in NCEA rather than Merit or Excellence or Scholarship after that. (Susie, q2, 2008 interview)

Students also identified teachers whom they perceived as failing to support or encourage them in the pursuit of Scholarship. Some students spoke of their teachers' negative attitudes toward student success that had ironically provided students with motivation to succeed in NZQ A Scholarship:

> Contrary to the norm, my [subject] teacher didn't think I would achieve scholarship therefore I was more driven to succeed in the examination, more so than in the other scholarship exams I attempted but did not achieve. (Female, q3, 2008 survey)

> She didn't encourage me. She told me that I wouldn't be able to sit because I didn't do this subject in the 6th form. It was a motivator for me – I decided to get it in spite of her. (Female, q5, 2007 survey)

Students gave examples of teachers forming opinions about student low capability without having engaged with the class. One of the students who experienced this situation describes how students responded positively when her teacher reassessed his own goals and aligned them with those of students aiming for high achievement:

> … and he rarely went into the excellence stuff...There was something quite unusual about what he said…we were going over like an excellence question and he pulled a few of us down the back of the class to do it and he realised a lot more people were paying attention and he said "I mis-judged the class" or something. So I got the feeling he had purposely selected the people he thought were going to cope with the stuff and he just taught them. …I remember he used to discourage us from getting the 'Aiming for Excellence' workbook and just stick to the 'Gaining Credits' workbook. Whereas in the other maths class – with a teacher who believed in her students - it was compulsory to have the 'Excellence' workbook….Last year's class everyone was noisy and not really paying attention. This year everyone is paying attention and that helps a lot. I think it helps the teacher as well. (Susie, q2, 2008 interview)

The reasons students gave for viewing these teachers as unsupportive included a lack of teacher knowledge, no evidence of teacher commitment to high-ability students, and, a lack of teacher confidence in students' ability:

> In general my teachers weren't particularly knowledgeable in their subjects. (Jane, q2, 2008 interview)

> I don't think our teacher was at all supportive compared to what she could have been. I think we could have had [Scholarship] classes...we had a group of people but she [the teacher] wasn't really involved as much, we were just teaching ourselves. ... I would like to have done other subjects but they weren't encouraging enough for me to try but they weren't prepared to offer their own time...He [teacher] wouldn't share the environment and knowledge he had to help me. (Molly, q3, 2008 interview)

> My first maths teacher I had at the very start of the year whom I get along with very well told me I didn't have a hope in hell of passing. I like proving people wrong. (Male, q5, survey 2008)

Students also claimed that some teachers were attempting to teach at a level they seemed unprepared for:

> Whereas there were a couple of teachers that just didn't know their subject particularly well, or to the level where they could actually sufficiently teach Scholarship – some teachers were incredibly knowledgeable but just couldn't get the information across in a way that we could understand it …I know there were a couple who were teaching because they had nothing else to do (Jane, q2, 2008 interview)

> Yes, he's taught [subject] before but only to the Level 3 level. He doesn't have a qualification in that area or anything. … it's very much a case of us reading out of a text book because he hasn't actually done the paper we're doing... he leaves us with the text book mostly, to learn out of that. (Theo, q3, 2008 interview)

Students articulated where they felt the lack of support they perceived had emanated from school management:

> I had a couple of very good teachers who supported me, but there was a lack of support from management in school and some teachers, so it was particular subject teachers [to help]. These teachers taught me for more than one year and it was their constant support, wisdom, enthusiasm and belief in me.… (Female, q3, 2008 survey)

As this previous statement shows, whenever students cited negative teacher or school attitude, something or someone else had encouraged these students towards attempting Scholarship, and the students had been successful (hence included in this study). Students compared the teacher in whose class they had achieved success with others whom they perceived had not assisted them:

> I didn't so much contrast her [with other teacher] as she was on a whole other platform altogether. I knew that no other teachers in my view were like her at all… They [the school] definitely didn't encourage excellence. I think they left it up to the individual teacher and when you have teachers with difference performance levels, that's a really wrong thing to do. And that's why I think the teacher who tutored me for (subject)... I think I excelled because she didn't leave it up to the school to give me...she did it herself... she did it herself rather than letting the school decide if it was up to me or not. (Myles, q1, 2008 interview)

Interestingly, sometimes this other form of encouragement came from finding like-minded peers. Susie who previously described one teacher who aimed only for 'Achieved' describes the influence of like-minded friends:

> And then my friends are also like really smart people and they would just sit down and study which was a really great incentive for me to study as well. (Susie, q2, 2008 survey)

Although this meeting of like-minds was not a catalyst for all students who experienced perceived negativity:

> I think I'm best studying by myself so they didn't have any influence. (Molly, q3, 2008)

Student comments pertaining to perceptions of negative Scholarship experiences were quantified. Each of these comments (N = 28) has been calculated as a percentage, and these – and the school quintile of the student to whom the comment was attributed – are shown in Figure 7. Also shown in this figure is the proportion each quintile held of the whole data set (N = 332).

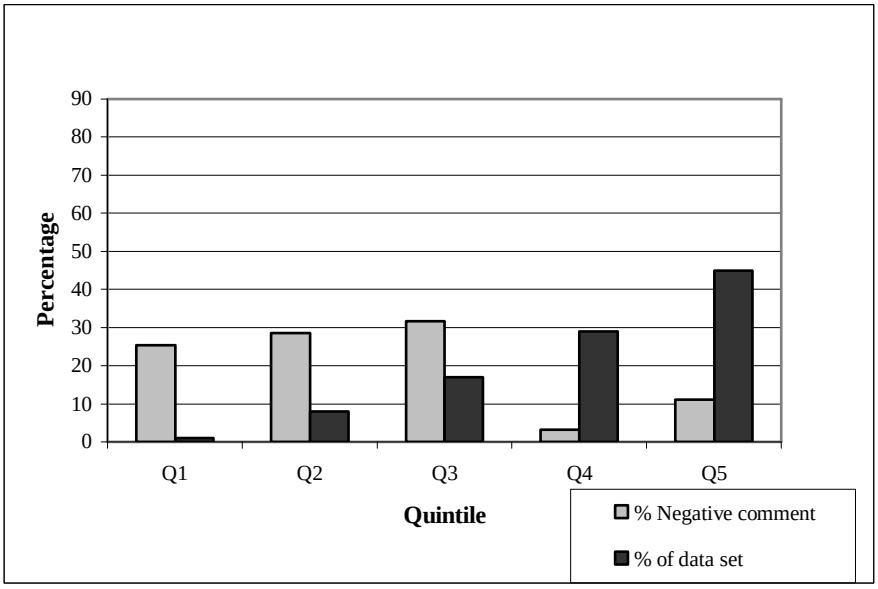

Figure 7: ***Students' negative perceptions of scholarship experiences***

As Figure 7 shows, calculated as a percentage of all participants from each quintile, the majority of students who reported negative Scholarship experiences pertaining to their school or teacher came from quintile 1, 2 and 3 schools. Of the entire sample in this study (N = 332) the percentage of students reporting dissatisfaction was 8.4%. Although this percentage seems relatively small, it must be noted that fewer students participated in this study from those schools where students indicated most negative experiences, that is, schools with quintiles 1, 2 or 3 (i.e. quintile 1 = 6 participants; quintile 2 = 28 participants; quintile 3 = 55 participants). This finding mirrors the data on the NZQA Statistics site that shows fewer students in low decile schools gaining external credits in NCEA, compared with students from high decile schools. The data and student comments in the study suggest that school quintile could be a factor in:

a) student participation in Scholarship, and
b) student access to school and teacher support for Scholarship.

Further statistical testing of factors relating to students and school quintiles was not possible as in each instance, one or more cells required for analysis had an expected count of less than five.

Schools

Student comments suggested several patterns in the ways their schools disseminated information about Scholarship. Some schools readily made Scholarship information available and actively promoted Scholarship within the school, and others left it to the students to gain the necessary information. Students who reported their school

had not given them information about Scholarship said they were initially unaware of the possibility of Scholarship and learned about it through means other than their school. After explaining that his school had not provided students with information about Scholarship, one student suggested:

> More information has to be given directly to the students rather than wasting time giving it to the school and hoping the school will give it to the students... (Myles, q1, 2008 interview)

Finding time to study

A pattern emerged relating to whether students found time to study the subjects in which they thought they would be successful. Data obtained through the on-line survey suggested females were more likely than males to consider that it was sometimes or always true that they found time to study the subjects in which they thought they would be successful (see Figure 8).

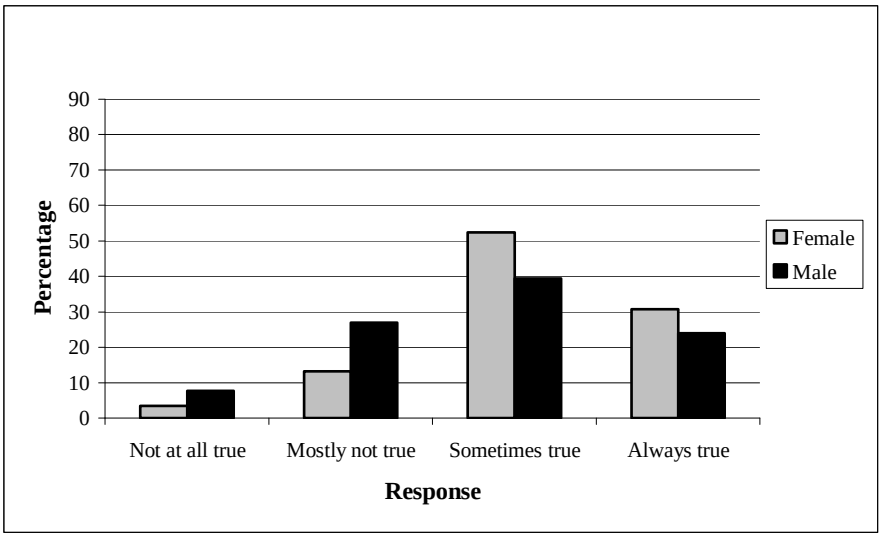

Figure 8: ***Students' perceptions of whether they found time to study subjects they thought they would be successful in***

This association was tested using a hypothesis of no association between students' perception of finding time to study the subjects in which they thought they would be successful, and students' gender. The hypothesis received no support from the data: χ^2 (1, N=321) = 13.597, p<.0.001. Triangulation of these data sources revealed agreement regarding an association between students' gender and finding time to study those subjects in which they think they will be successful with girls reporting a more strategic approach than boys.

Table 13: Correlation relating to students' perceptions of time

Variables		Pearson Correlation	% of variation in common
NCEA	Time	$r_p = 0.214$**	4.5
Excellence	Time	$r_p = 0.181$**	3.2

** $p < .001$

The statistical data were again tested to identify any relationship between students finding time to study and choosing subjects that gave them 'higher' rewards, namely Merit or Excellence. A positive correlation was found between students' perception of taking subjects that allowed them to try for 'Merit' or 'Excellence' rather than just Achieved (NCEA) and finding time (Time) to study ($r_p = 0.214$, $p = .001$). As Table 13 shows, the proportion of variances shared by students aiming for 'Merit' or 'Excellence' in NCEA and finding time to study is about 4.5%.

There was a significant positive correlation between students' perception of expecting to get 'Excellence' or 'Merit' in NCEA (Excellence) and finding time (Time) to study ($r_p = 0.181$, $p = .001$); the proportion of variance shared by students gaining 'Merit' or 'Excellence' in NCEA and finding time to study is about 3%. That is, finding time to study was significantly associated with getting Merit and/or Excellence in the NCEA.

Statistical investigation also considered student responses to giving up social activities, by gender. These data are displayed in Figure 9 which shows that females were more likely than males to give up social activities in order to study.

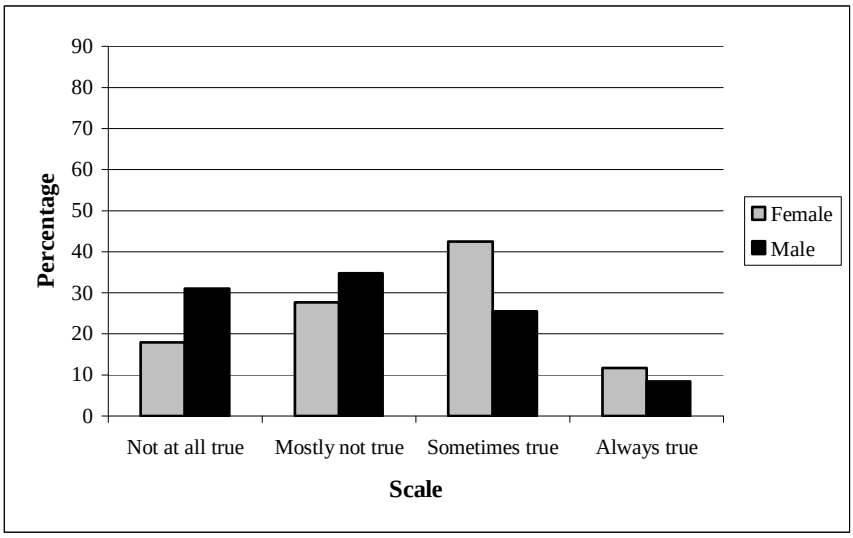

Figure 9: ***Student responses by gender to giving up social activities***

Question 3: What were the Year 11, 12 and 13 academic performance pathways and achievement patterns reported by the 2006 Scholarship recipients?

Student pathways that led to success in Scholarship were varied. Some had attained Excellence and Merit endorsements in NCEA; some reported they had used Scholarship as a form of enrichment or acceleration, sitting the exam in Year 11 or Year 12 instead of Year 13, as most students do.

NCEA achievement

The percentage of students gaining an endorsement increased between Level 2 (Year 2006) and Level 3 (Year 2007) providing evidence of improvement in student achievement between Level 2 and Level 3 NCEA. With an endorsement offered for the first time in 2007, almost one third more students gained an endorsement than had gained one retrospectively for Level 2. At the time of sitting Level 2, students did not know that they could earn an endorsement and were only aware that they could gain 'Achieved' or 'Not Achieved', and increase their number of credits gained. The increase in 'Merit' and 'Excellence' endorsements in 2007 compared with those gained retrospectively in 2006 suggests that this was a goal that students valued and that they were prepared to give up activities in order to achieve this academic status.

It is interesting to consider differences in student endorsements in relation to the overall type of Scholarship Award they received (e.g. Single Subject, Top Subject, Scholarship Award, Outstanding Scholar, Premier Award). It appears that in this research, of those students who gained a Level 3 NCEA endorsement 26.9% gained 'Excellence' and a Single Subject Award in the Scholarship examination. These findings could suggest that these students were strong academically *not only* in the single subject in which they gained Scholarship, but in a number of subjects as in order to gain Excellence students need to aggregate 50 Excellence credits and these cannot be gained in one subject alone. It is also possible (and was indicated by some students) that these students gained more than one Single Subject award. Perhaps it is worth mentioning here, that from 2011 students will be able to gain Single Subject endorsements in the NCEA.

Provisions for gifted and talented students

Just over half of all participants stated that their pathways to Scholarship success had included being a participant in a class or programme that they perceived as having the purpose of providing special provisions to meet the needs of gifted and talented learners. When asked to describe these further, students suggested that although they believed the classes were intended to provide enrichment for able students, they did not always do so. The students attribute this to a range of factors with the most frequent being a lack of programme organisation. Students also commented on the admittance to 'special' classes saying that entry was neither transparent nor obvious.

It was apparent from student interviews and survey responses that some schools are using early entrance to NCEA as a form of enrichment or acceleration. However, students had also found that the subjects in which students were invited to sit NCEA ahead of their peers were not always the subjects in which the student considered their strengths lay:

> I did Maths and Science a year early but they weren't my strong subjects, but they were the only subjects they allowed you do a year ahead. (Amy, q2, 2008 interview)

Students as young as Year 11 were opting to sit Scholarship, and some were obviously successful in so doing. Students in both Years 11 and 12 spoke of using early entrance to Scholarship for the practice, as a means of improving scores or increasing the number of subjects in which they were successful when they sat again.

> I am a year 11 student so I sat this exam just as a trial to see how well I could do. (Female, q5, 2008 survey)

Where it was an option, students were choosing to study university papers while still in high school. This meant that those students who had been able to study one year ahead (i.e. Level 1 NCEA in Year 10; Level 2 in Year 11; Level 3 and Scholarship in Year 12) were taking university papers in Year 13, in addition to re-sitting Scholarship, even if they had been successful the first time. Theo who was returning to high school and had gained multiple Scholarship passes in Year 12 explains:

> I've been doing all 4 subjects History, Stats, Physics and Chemistry – a year ahead pretty much since the 3rd form so I did Level 3 last year and I'm doing university papers in most of them this year. (Theo, q3, 2008 interview)

Future pathways

Students in this study appeared to evidence a strong sense of self-belief manifested by being aware of what they wanted to achieve in life, and the direction they needed to take to realise their goals. There was similarity in students' plans for the future with most students in this research choosing 'go to university' as their first choice in the year following their Scholarship examination. Students still attending high school indicated that their first choice was to continue at high school, and the next most popular choice of further direction was the unspecified 'other'. Many of the students commented that they had always aspired to go to university:

> I think I just always knew I was going to go to university, I didn't know which course I was going to take. I always liked school so I thought I would prolong that experience. (Amy, q2, 2008 interview)

For some, gaining a Scholarship and the Scholarship money that is associated with this success assisted them in achieving that goal:

> … I know that in my hall [university] there are people around me that got 3 Scholarship so they're enjoying the benefits of not having a student loan I think, with the benefit of 2,000 [dollars] a year. It's a bit more than 500 but I'm not complaining because I didn't have to do a heck of a lot of work really for $500. So I think it is definitely a help even though it comes a bit later in the year when you've already bought everything. It certainly helps towards the fees and living costs. (Sean, q4, 2008 interview)

The value placed on remuneration for Scholarship success is discussed further in the next section that addresses question 4.

Question 4: To what extent did the students' valuing of Scholarship influence their success?

Student opinion varied regarding the valuing of Scholarship and there were differences in the ways it was valued across students.

Schools

Schools demonstrating an appreciation of those students who had gained Scholarship and acknowledged student achievement also valued Scholarship. They made this apparent by supporting students in gaining access to knowledge they required to prepare for the exams and through the provision of additional Scholarship classes. Schools where it was assumed students would not aim for or achieve Scholarship success were said to have valued Scholarship less or not at all. These schools were less likely to provide additional support for their students. However, as already

stated, in each school where students attained success, there was at least one teacher who supported the student aspiring to attain Scholarship success.

The monetary reward

Student comments relating to the monetary rewards offered to successful Scholarship candidates and the importance they felt the money had played in their decision to sit Scholarship were interesting. Some said they had not known it was offered so it had not influenced their decision to sit, others felt it had provided greater motivation to work for success:

> The funny thing is when I sat my exam the school didn't tell us anything about the money reward. So when I got it and I got $500 I was really, really happy. (Molly, q3, 2008 interview)

> I mean everyone put more effort in because it was worth money and if it wasn't worth money I don't think a lot of people would have tried and if there wasn't money I think they would have tried less. (Jono, q5, 2008 interview)

A third group believed it was too paltry an amount to have any significant bearing on their decision to attempt Scholarship:

> No – it's what – $500 for a single subject? And uni fees are like 4 or 5 thousand dollars each year. I don't know, but it's kind of low compared with that. (Susie, q2, 2008 interview)

Although the money that is offered acts as an incentive to some students, other factors appear to provide greater incentive. Included in these factors are the kudos a student may receive when they gain Scholarship, the recognition students may anticipate from one's school and the provision of an appropriate level of academic challenge, and the possibility of using Scholarship as a practice for Level 3 NCEA, with the aim of improving Level 3 results:

> Not [an incentive] in the environment I did it in. People did it more for the academic prestige, as something kind of on top of NCEA. (Becky, q4, 2008 interview)

> A lot of my motivation – probably my biggest motivation of all was I knew that if I was doing these subjects for Scholarship I would study more for my level 3 and I knew I'd get extra classes and stuff. So in some ways it was a lot to do with my attaining good level 3 results as much as doing Scholarship. (Steve, q3, 2008 interview)

On the other hand, no-one indicated that the monetary award was a disincentive.

The learning community

It appears that the way that Scholarship or high achievement is valued by the members of the student's learning community (including parents, teachers, peers, and others) can influence a student's attitude towards sitting Scholarship. This community attitude appears to affect the level of support a student can expect to receive from schools and teachers, and either increases the opportunities a student has to excel:

> One day I was late for school and a teacher was going to give me a lunch time detention which is when Scholarship classes were. But the DP saw and she said "don't make her do detention because she has Scholarship classes". I think you got it a bit easier because you were doing Scholarship. (Lucy, q3, 2008 interview)

or reduces them:

> …basically not many people go for it [Scholarship] because they think it's too hard and too much work and like my year started out with a 100 people and at the end of it 12 passed – Level 3 [NCEA]. About 40 people were in the year at the end. [After leaving school] Most students here tend to just drop out or go on the dole or work in a supermarket. There's not a great expectation by the community to go to uni or get all that much out of life… (Jane, q2, 2008 interview)

This unexpected finding related not to the students' valuing of Scholarship but to their schools' valuing (or non-valuing) of high academic success. This pertained to the perception of some students that school expectations in relation to student achievement goals were low and definitely not in alignment with student aspirations of achieving Merit, Excellence or Scholarship. These on-line survey comments and interview remarks revealed dissatisfaction with the level of support they had received from their school and community. In addition to this, some of these students articulated that where their community held low expectations for student career options, these were also matched by school and teacher expectations.

Summary of Findings

Students in this study perceived a range of factors to have facilitated their success in NZQA Scholarship. These factors include: the subject area teacher; friends, peers and family members; and, intrapersonal factors relating to ability, effort, interest and enthusiasm, persistence and luck. Overall, the single factor that most students suggest was the catalyst in their success – and also the core code in this grounded study – their teacher.

A number of patterns emerged pertaining to student decision-making about when or whether to attempt Scholarship; student participation in extracurricular activities coupled with an evident increase in participation in leadership activities in Year 13. Statistical evidence supported a number of themes that had emerged from the qualitative data. These included gender responses in finding time to study and giving up social activities in order to study, with more females opting to do both; students taking subjects that allowed them to try for Merit or Excellence rather than just Achieved and also finding time to study; and, these students' expectations that they would gain Merit or Excellence in NCEA. There were relationships identified between a number of factors pertaining to parents and teachers, including a strong correlation between students' perception that their teachers were knowledgeable in the subjects in which the students gained Scholarships.

Data from the on-line survey showed that students in this survey gained more Merit and Excellence endorsements in NCEA in Year 13 than they did in the year previous. There appeared to be no relationship between students gaining an endorsement and the type of Scholarship Award they received. Students described variations of school-based opportunities that were instigated to provide enrichment or acceleration for able students.

These findings also reported student perceptions of negative teacher attitude, poor teacher content knowledge, a lack of teacher expectation of success and in some cases, a lack of school support for high achievement. Those students identified these factors as barriers that had hindered their preparation and access to NZQA Scholarship.

Interpretation of these findings has identified a number of areas that relate to the core code, that is, the importance of the teacher – and for these students that was most often their Scholarship teacher. This code forms part of the core theme to emerge from this study, that of the importance of the connection between this teacher and aspiring Scholarship students. A picture emerges of a student who believes he or she can gain NCEA with an endorsement of Merit or Excellence and can aspire to gain Scholarship if he or she forms a positive relationship with at least one teacher. It seems important to these students that this teacher facilitates the student's preparation for Scholarship. Students perceive this can be achieved through:

- the provision of appropriate pedagogical approaches,
- taking an interest in the student's achievement, and
- making it evident that they, the teacher, believes the student can be successful in gaining Scholarship.

These successful students also perceive that their family and friends or peers are supportive of their efforts to gain Scholarship.

The next chapter will explore the consequence of these findings. It is organised around two theoretical propositions: a) Catalysts and Inhibitors b) NZQA Puzzle Pieces. Consistent with grounded theory, a model is used to describe phenomena. The theoretical propositions will provide tentative understanding about NZQA Scholarship and those factors that students perceive have influenced their success.

CHAPTER 6

Theoretical Propositions Grounded in the Data

As described earlier in this thesis, the theory that emerged from the data gathered was intended to generate rather than validate a data-based theory (Schraw et al., 2007). The data fit into two theoretical propositions that have emerged from this research and are a means of promoting formative inquiry into NZQA Scholarship and those factors students consider to have facilitated their success. Each of these themes is described based on data that emerged from this study and should be tested over time through more empirical evidence and study. Student comment is used to provide the chain of evidence that links these propositions to the research. These themes are summarised in Table 14.

Table 14: Summary of themes from the grounded theory analysis

Making Connections	
Proposition 1 – Catalysts, Inhibitors & Mavericks	Proposition 2 – NZQA Puzzle Pieces
1. Role of the teacher in promoting high academic achievement	2. Interrelatedness of factors that influence high achievement

Two 'big ideas' have emerged from these findings, and they each provide one theoretical proposition that describes student perceptions relating to their experiences and perceptions of NZQA Scholarship. In this chapter each of these will be outlined and described. As previously stated, the core category that is evident in each theory is the role of the teacher as the catalyst in these high-ability students' success. It is important to clarify that these ideas pertain to this specific group of high-achieving students, and further study is needed to investigate generalisation to the wider population of high-achieving students and/or gifted and talented students.

Theoretical Proposition 1: Student participation and success in NZQA Scholarship is either furthered or hindered by teachers who act as catalysts, mavericks or inhibitors in student success.

All student participants in this study were successful in NZQA Scholarship, and the core code describes the student-teacher relationship that these students perceived as critical to their success. Many students reported that they experienced inspirational

teaching, and their path to Scholarship success was paved with support from the student's family, the school, as well as from friends and peers. For some students, there was challenge in the process of initially accessing NZQA Scholarship and then gaining the content knowledge required. For these students the student-teacher relationship with some of their teachers was flawed. These participants perceived that in addition to having teachers who did not facilitate their participation in Scholarship, the school and the community also failed to provide the support these students considered critical to their success. The themes that support and frame this core code and findings are elucidated below.

Influences on high-ability students' success

The Teacher-Catalyst

The Teacher-Catalyst is characterised by his or her *participation* in the student learning process. A Teacher-Catalyst demonstrates this through his or her support for the student's pursuit of high achievement. This support has several guises and includes, but is not restricted to, providing additional out-of-class support for Scholarship study that may involve the Teacher-Catalyst giving up some of his or her own time to support students preparing for Scholarship. As one student comments:

> …I'd write practice essays to give to her and stuff and she'd go over them in her own time. Just putting in that extra yard…. (Jane, q2, 2008 interview)

The Teacher-Catalyst is profoundly knowledgeable about his or her subject and has strong pedagogical skills that are used to disseminate this knowledge. These skills are demonstrated during interactive lessons and through the changed status that students recognise is accorded to them. Students perceive their progression to Year 13 accords them a more equal or adult status with their Teacher-Catalyst.

Teacher-Catalysts have positive relationships with his or her students through the creation of a partnership in the learning process. This partnership is formed through the teacher's aspirations for student success that are shared with the student. The Teacher-Catalyst articulates confidence in the student's ability to be successful in Scholarship and this has the effect of raising student expectations and self-belief in his or her own success. Students perceive that having a teacher believe they can achieve Scholarship is motivation to 'give it a go'.

> ...knowing that a teacher thinks that you can do it is enough motivation to work hard to get it. (Female, q5, 2008 survey)

This belief may act as an inducement to study hard in order to live up to those expectations and not wanting to let the teacher down by failing.

These teachers who inspire Scholarship students and motivate them towards sitting the exam assume almost mythical proportions when students regale their professional and personality qualities. They not only hold or direct the student to the body of knowledge required to compete at this high academic level, but their personality attributes mean that they are able to imbue their enthusiasm and love for their subject into the student.

> I was lucky enough to have an amazing teacher in 6th and 7th form. [Teacher's name] was enthusiastic, passionate, supportive, intelligent, perceptive, and inspired me to do well in the subject. She had a unique ability to make learning fun, and make her students determined to achieve. (Female, q5, 2008 survey)

This interest demonstrated by Teacher-Catalysts for their specialist subject engenders their students' interest in the subject. Students perceive this shared interest as important in securing their success.

These teachers' classrooms are learning laboratories where the Teacher-Catalysts provide feedback that makes it clear to students what it is the teacher expects from them and, most importantly, how to improve. This Teacher-Catalyst is most often the teacher in whose subject the student is successful in gaining Scholarship – but not always, as one student explains:

> There are definitely certain teachers who've encouraged me a lot to continue down the path I've been going and to go ahead with my schooling ... None of them have taught me Scholarship… (Theo, q3, 2008 interview).

Regardless of whether they taught the student for Scholarship, it appears this role is akin to that of a supporter through the provision of positive role modelling and a daily demonstration of a love of learning. This Teacher-Catalyst also promotes relevance of curriculum content by linking it to everyday and personal situations.

> He made the subject interesting and made me feel enthusiastic about it which made me enjoy it and think about [subject] in everyday situations which made me understand it better and therefore get better results. (Female, q5, 2008 survey)

The Teacher-Inhibitor

Teacher-Inhibitors are *observers* of the learning process. They instruct students, but do not involve themselves with student learning, exhibiting a remoteness or

detachment. This remoteness may permeate the entire school, generating pervasive staff and student apathy, with associated low expectations of, and for, student achievement:

> ...because we don't have that many people doing Scholarship it's not like one of the main focuses of our school. We usually just …teachers just get more 'achieved'. (Susie, q2, 2008 interview)

Teacher-Inhibitors may arrive in class without having engaged sufficiently with the knowledge and content needed to deliver a lesson to high-ability students aiming for success in Scholarship. In some instances, this has led to the students teaching themselves from a text. Students identified teachers who had not yet attained the expertise required for teaching at Level 3 NCEA or Scholarship, and they were obviously ill-prepared to transmit relevant knowledge to students. Jane describes her experience:

> Whereas there were a couple of teachers that just didn't know their subject particularly well, or to the level where they could actually sufficiently teach Scholarship … (Jane, q2, 2008 interview)

The Teacher-Inhibitor's presence was perceived by students as having a negative effect on their learning and aspirations. Students reported teachers who only aimed for their students to gain 'Achieve' and no higher in NCEA, with occasions where this decision was made before the teacher had even engaged with a class. The students also perceived that these teachers chose not to provide additional support for students wishing to attempt Scholarship.

> … the teacher did end up just teaching us 'achieved' and 'merit' questions and he rarely went into the excellence stuff... (Susie, q2, 2008 interview)

Students identified a number of reasons they perceived as explanations for the attitude of Teacher-Inhibitors and the reasons they were passive observers in education. Some, they explained, were teaching because they had nothing else to do. Others, students believed, were encouraged or coerced into the role of teaching Scholarship even though they clearly did not have the qualifications or knowledge required to teach at this level:

> Yes, he's taught [subject] before but only to the Level 3 level. He doesn't have a qualification in that area or anything. … it's a case of, very much a case of us reading out of a text book because he hasn't actually done the paper we're doing...It's a case of: he leaves us with the text book mostly, to learn out of that. (Theo, q3, 2008 interview)

The Teacher-Maverick

Where the students in this study identified teacher inhibitors, they also identified at least one teacher who has supported them, seemingly doing so in spite of working in what students perceived to be an environment that was unsupportive of high academic success. Where these students encountered boredom or disillusion with their school's ability to cater for high-ability students, they found support from one lone teacher.

Characteristics of these Teacher-Mavericks include all those described by students who received support from their inspirational teachers, as each of these Teacher-Mavericks are also those inspirational teachers with positive professional and personality characteristics. These Teacher-Mavericks demonstrate their support for high academic success in high-ability students, in spite of students' perceptions that other teachers in their school – and members of their school community – did not generally support high achievement.

The Teacher-Maverick gives his or her own time to work with these students. When school has finished for the year, the Teacher-Maverick maintains interest in the student's examination results and makes contact with the student to congratulate him or her on their success.

Theoretical Proposition 2: There are multiple pieces that comprise the academic puzzle that represents success in NZQA Scholarship. Critical to them all is the central positioning of those pieces that represent the relationship between the Teacher–Catalyst and the aspiring Scholarship student. Those peripheral pieces that complete the puzzle comprise many other facets of Scholarship, and the connectedness of these factors is also important in facilitating high academic success.

NZQA scholarship puzzle pieces

Students perceive that the Teacher-Catalyst provides the puzzle piece that adjoins the successful Scholarship student, with these two pieces comprising the centre of the academic puzzle that is NZQA Scholarship. There are a number of other pieces that students perceive as having influenced their success, including their family, friends and peers, and intrapersonal motivation factors. These subthemes fit together to complete this puzzle. The relationship between these themes is shown in Figure 10. The central connection in this model of a successful relationship is that connection

between the Scholarship student and the Teacher-Catalyst. Also important (but less so) is the student connection to family, friends and peers, their extracurricular activities, their intrapersonal beliefs and their valuing of high academic success that is shared with family, friends and peers. Each of these sub-themes connects to the student, with the intrapersonal beliefs puzzle piece also connecting to the teacher. The teacher connects with the student, and also connects to a supportive school management that includes provision for appropriate curriculum and learning opportunities, and to the belief the Teacher-Catalyst demonstrates for the student's capability.

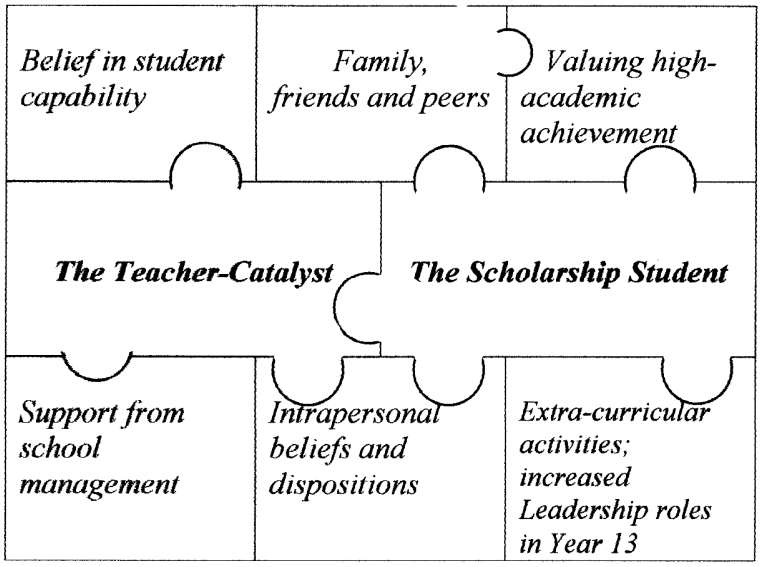

Figure 10: ***The NZQA Scholarship puzzle***

Family, friends and peers

Families, friends and peers are credited with supporting students, and families are also credited with articulating their expectations for high academic success. Where their family are concerned, this perceived support is often divided with students describing clear gender roles: the mother occupying the confidante, home-making role, and the father providing academic support.

> …she [my mother] was the person I would talk to… and help me with actually studying and that sort of stuff and just sort of more motivation when I didn't really feel like studying…. (Steve, q3, 2008 interview)

> Mainly Dad's support really, and that's where a lot of my general [subject] knowledge came from – him being a [subject] teacher and now a [subject] lecturer. (Sean, q4, 2008 interview)

Some students perceive the support and ensuing pressure as relating to their ethnicity. They believe it is their duty to avail themselves of opportunities for high

academic success to redress the imbalance of perceived unequal opportunities for older relatives.

> My granddad came from [an overseas country] and my family came from [country] and we weren't entitled to any education over there. Um...but I did it for his honour really to take advantage of this opportunity that I was actually given…. (Myles, q1, 2008 interview)

Similarly, some students feel the need to excel because they see academic excellence as part of their cultural expectation, the result of familial pressure to do extra well:

> First off, my family and my cultural background because I'm Asian and there's pressure there to do well. (Susie, q2, 2008 interview)

For many Scholarship students, their friends and peers satisfy these high-ability students' need to compete:

> Well, my friends were probably my biggest competition and we were very competitive so that was probably our motivation to do better and we wanted everybody to do well… (Steve, q3, 2008 interview)

Competition is perceived by these students as one way of improving their academic outcomes, assisting them to aim high and to work harder in order to be more successful than those against whom they are competing.

Extracurricular activities

Participation in extracurricular activities provides students with opportunities to demonstrate leadership, and it is an opportunity that most students avail themselves of in a range of activities. Leadership is very important to these high-achieving students, and this is shown statistically through their increased involvement in school leadership opportunities as they reach Year 13. This finding is consistent with the literature on the relationship between certain kinds of extracurricular activities and high academic achievement in secondary school (Eccles et al., 2003; Guest & Schneider, 2003).

Appropriate curriculum and learning opportunities

Being given the opportunity to fulfil self-expectations of high achievement is crucial to these students. They recognise these opportunities when they are offered, and avail themselves of them even during out-of-school hours. Importantly, this group of high-ability students – most especially the females in this group – are prepared to relinquish social activities in order to prepare for high academic success where they perceive they will be successful.

> I gave up a couple of sports. And I went on with music but then I also stopped attending a couple of practices for concerts and stuff to study....pretty much throughout the year… I used to work three days a week, then I only worked one...During exam time I would just take work off – I wouldn't work at all. (Lauren, q2, 2008 interview)

With the perceived support of their parents and their Scholarship teachers, these students make their goal 'high academic success'. They aim high, *expecting* to achieve Merit, Excellence or Scholarship. High-ability students acknowledge opportunities they have had that have enabled them to work with others who want to do well:

> The classroom was one where all the students wanted to do really well. Two thirds of this class ended up with Scholarship. The teaching was aimed at a high level – we had lots of discussion and interactions. The teacher really helped with that by making lots of resources available to us...heaps of exams that had been marked...we could write practice essay – she made lots of options [available] for us. (Jono, q5, 2008 interview)

These classrooms have discussions that are facilitated by teachers who demonstrate their knowledge of their specialist subject, who are not afraid to share the power in the classroom with these students. They encourage and welcome participation.

Also valued is constructive criticism given as feedback that provides focus for high-ability students, enabling them to improve their work and move closer to their goal of high academic success.

Intrapersonal beliefs and dispositions

Intrapersonal beliefs that relate to ability, effort, interest and enthusiasm, persistence and luck are one piece of the NZQA Scholarship Puzzle. Interestingly, this piece connects not only to the student but also to the teacher and is the only piece to do that. Students who perceived ability, effort, persistence or luck as the reason they were successful, relate these beliefs to personal endeavour, perseverance, being lucky or being very, very able:

> I knew I was capable of achieving at the highest level in history because of my past results and my teacher's encouragement of me doing scholarship. I knew that if I put the work in the ability was already there and I just had to build on it. (Female, q4, 2008 survey)

The connection between intrapersonal beliefs and Teacher-Catalysts comes through the intrapersonal belief, interest and enthusiasm. This group of students has identified the importance of role of the Teacher Catalyst in engaging them in

learning, sustaining their interest, and through the engendered enthusiasm for that teacher's specialist subject:

> I think that both my own and my teacher's enthusiasm for my subjects played a crucial role in me achieving scholarship. This shared enthusiasm made it considerably easier as studying for the exams was fun and interesting rather than a task… (Female, q4, 2008 survey)

Support from school management

The ways in which a school values high academic achievement is reflected in the teachers and students within the high schools. Where students perceive the school as supportive of high academic achievement, they aspire to earn their place on the school's honour roll or to receive the equivalent form of recognition. As Steve articulated:

> ...in at my school, up in the assembly hall there's a board of all the awards which have been given out... Scholarship past students over the past years. I always look at it whenever [I'm] at assembly. It's always like there in your mind – for me it's kinda like part of my motivation to get my name on the board because then I'd be remembered I guess, so that was something to aim to. (Steve, q3, 2008 interview)

Teachers are inspired to grow capacity within curriculum teams, to facilitate high-ability programmes that engender enthusiasm not only amongst the learners, but also amongst the teachers.

> …to invite them [department staff] to deliver a seminar in front of their colleagues and students. So what they then did was, they spent hours – you have no idea how many hours they spent preparing this thing. They had to cover … in one lunch time. It had to be your 'top notch delivery' …What it has meant is that it has increased 200 fold the teachers' performance in terms of what they can do inside their classroom... (Julia, teacher 2008 interview)

Where management also reflect these views:

> They encouraged me quite a bit. In assemblies they said people should do it.

a cyclic process in enacted. This process is shown in Figure 11.

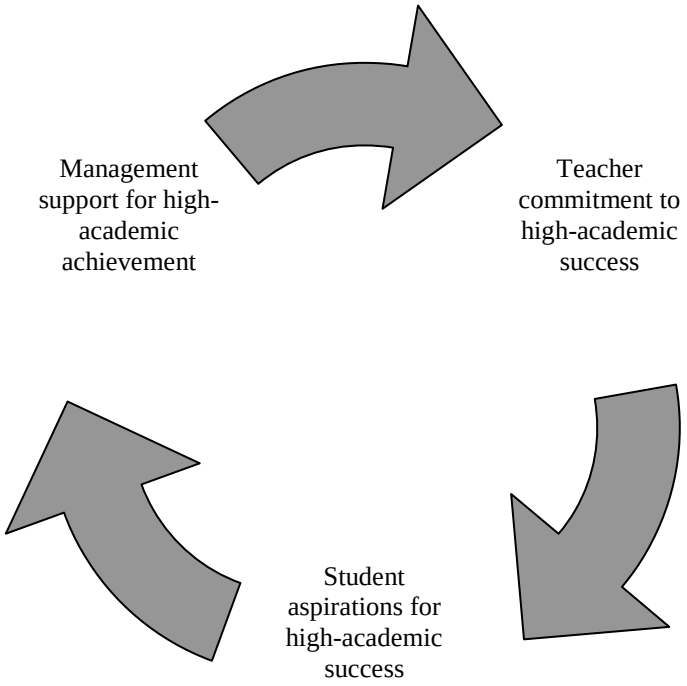

Figure 11 ***The cycle of high academic achievement***

Thus the jigsaw that is the NZQA Scholarship Puzzle is complex and makes it evident that based on these students' perceptions, those students who achieve success in NZQA Scholarship are influenced by not one, but several different factors. It is the relationship between these factors that supports their learning process, supported by the two centre pieces that form a connection. It is that connection between the Teacher Catalyst and the Scholarship students that these students perceive is critical to their success.

The next chapter will examine how the propositions from the study relate to the boarder literature on gifted and talented students. This analysis will be followed by some implications for both theory and practice related to educating students for high academic success as well as suggesting areas identified through this study, that require further research.

CHAPTER 7
Discussion

Factors that Facilitate High Academic Success

This thesis makes a unique contribution to the literature and research pertaining to students who have demonstrated high academic ability. Previous research has reported on the personality and professional characteristics of teachers of the gifted (e.g. Chan, 2001; Mills, 2003; Vialle & Quigley, 2002). In contrast, this study provides new information about the characteristics and activities of mainstream teachers who were seen as having been particularly instrumental in their support for high-achieving students. This research was not originally designed to investigate these teacher characteristics, but was instead focused on factors that Scholarship recipients perceived to have the greatest influence on their success. Successful Scholarship students claimed it was their teacher who had the greatest influence on this success. The reasons they gave to support their choice included the most compelling explanation: the connection they established with at least one teacher. This connection assumed even more significance for those high-ability students who were attending schools where they perceived that the culture was not particularly supportive, and it did not engender high academic success.

There are some areas of overlap in the existing research regarding teachers who are effective in working with students who are gifted. For example, Vialle and Quigley (2002) reported that older (Year 11) gifted students preferred teachers' intellectual qualities over their personal qualities. In a separate study, Vialle and Tischler (2005) identified that gifted students prefer teachers who demonstrate both favourable personal and intellectual skills in addition to using a range of pedagogical approaches. Students who attained Scholarship similarly reported that their relationship with their teacher was important, and these students also appreciated teachers using a range of pedagogical approaches to disseminate information. They perceived that pedagogical approaches that encouraged a range of learning experiences enabled the teacher to assume the role of facilitator, an idea that was also identified by Riley et al. (2004) in their New Zealand report investigating approaches to teaching gifted and talented students. Kanevsky and Keighley (2003) identified the importance of teachers of the gifted demonstrating that they care about their learners: this finding was also true of these Scholarship students who commented on the

significance of teachers articulating belief in the student's ability to be successful. On the other hand, Robinson (2008) noted that the literature and research in gifted education has focused on describing and documenting teacher characteristics rather than establishing links between teacher characteristics and student achievement in schools. This Scholarship study has done this in identifying links between teacher characteristics and high academic achievement as reported by a large sample of these students.

The insightful recounts of these high-ability students provide detail of what really matters to students seeking high academic success. Student self-report in surveys and substantive in-depth interviewing revealed that what teachers say and do makes a difference to their learners. These Scholarship recipients responded strongly to teachers articulating belief in student capability and connecting this with high academic success. They retrospectively observed that having a teacher express confidence in student success provided the motivation to work hard to fulfil that expectation. Students said that having teachers who shared their enthusiasm for a subject meant they worked harder. They also affirmed that teachers who were knowledgeable in their own subject and the NZQA system scaffolded students and prepared them for success because their knowledge enabled them to predict the focus of examination questions.

This study identified the importance of context in student learning. Schools that facilitated high academic success were more likely to have teachers in their employment who shared student aspirations for attaining Scholarship. Students expressed a view that in schools where the perceived school culture did not encourage academic excellence, there were fewer staff willing to support students aiming for high academic success. Students recognised this and the limitations this restriction placed on their aspirations for success.

This research provides an important contribution to the gifted literature by identifying that relationships between high-ability students and their teachers are critical factors in student success. These teachers were appreciated for their competence in the subject of interest to the student, but students additionally emphasised that it was the connection with the teacher – including the expression of high-expectations of student success – that made the difference for them. This

finding provides a unique contribution to gifted research; where other studies have hypothesised links to student outcomes (Robinson, 2008) this research has identified what has already worked for high-ability students. This study has gone beyond identifying what students and teachers *believe* matters in the education of gifted students, identifying instead what actually *has* mattered and made a difference to the achievement of these high-ability, successful Scholarship students.

Limitations

Certain limitations of this study need to be acknowledged before discussing any implications of the findings. Firstly, despite having a relatively large sample, it is not known if this sample is representative of the larger population of gifted and talented secondary students or even of Scholarship students. Further research of academic giftedness is needed to investigate whether the patterns identified here are supported in the wider population of students performing at the highest achievement levels. Further use of mixed-method research could include longitudinal data. These data could offer insight into a number of aspects pertaining to high-ability students, including student preparation for examinations like NZQA Scholarship that acknowledge high academic success.

Secondly, the students' self-reports were completed retrospectively and it is not known if they might have yielded different responses had they been completed prior to the students sitting for Scholarship. We do not know if these obviously salient memories were completely accurate in characterising the kinds of supports that actually occurred. It may well be that teachers, mothers, fathers, friends, and even the target students themselves show subtle differences rather than matching exactly the major findings reported here based on the surveys and interviews after the fact. As all the data in the present study were retrospective, further research is needed that monitors students, teachers, and others throughout the actual processes of preparing for high academic success.

A third limitation pertains to the low numbers of student participants from quintiles 1, 2 and 3, when compared to the numbers of participants from quintiles 4 and 5. As mentioned, these data mirror those numbers of students cited on the NZQA website gaining NCEA external credits across all deciles. That site shows fewer students gain external credits in low decile schools, compared with students from high decile schools.

Reasons for this discrepancy evidenced in this study have not been identified, and this is one area that indicates the need for further research to identify why there are fewer numbers of successful students in low quintile schools, and higher numbers in high decile schools. It would also be interesting to delve into the ethnicity of students who gain Scholarship, and again, this is one area that was not identified in this study, but it could provide valuable information for teachers of students from all ethnicities.

This study did not set out to gain students' perceptions of negative experiences on their path to Scholarship examination. Had these negative responses been predicted, the survey may have been designed differently to collect more data around this perception. These data could have provided greater insight into those students with negative perceptions, the type of teaching they had experienced and the identification of any possible commonalities between them, including school quintile and ethnicity. Interestingly, there are two sets of students this study did not identify: those high-ability students who were not successful in gaining Scholarship and those high-ability students who chose not to sit Scholarship. Had this research included students in Year 13 who fell into either of these categories, it might have provided data that further explained internal and external factors that students perceive to facilitate high academic success.

Connections

The first theoretical proposition as discussed in Chapter Six identifies that student participation and success in NZQA Scholarship is either furthered or hindered by teachers who act as catalysts or inhibitors in students' success. This proposition purports what students' perceptions of teachers are, that those who engender students' success are supportive of the students' bid for high academic success. These teachers are seen as Teacher-Catalysts or Teacher-Mavericks, and both types of teachers share many characteristics including their willingness to go beyond classroom time to support students aiming for high academic success. Additional support has multiple guises including the provision of additional classes, access to appropriate and relevant material and the provision of pedagogical approaches that assist in engendering high academic success. It was hypothesised that students perceived the teacher in whose subject(s) they gained Scholarship was knowledgeable in that subject, and this was found to be the case. Students also perceived that their Scholarship teachers were supportive of students' study for

Scholarship and expected them to be successful, in addition to taking a personal interest in students and following up to make contact with them when exam results became known.

Students perceived instances where other teachers had not supported them in their quest for high academic success, expecting instead that 'Achieve' was an adequate pass. There was also a perception by some students that where there were teachers who aimed for 'Achieved' and no higher, the school (i.e., management) shared those low expectations. Nonetheless, each of the students in this study were successful in Scholarship and those students who experienced teachers who inhibited their access to Scholarship, also experienced one teacher who enthused, motivated and supported them in their pursuit of high academic success. Even in those schools where teachers and other staff members were not seen to be supporting high academic success for high-ability students, there was at least one teacher prepared to be a maverick, to strike out alone to support a student aiming to achieve Scholarship success. Further research is needed to investigate the existence of such "teacher mavericks" and their personality and professional characteristics. Who are they, how do they manage to work against the tide of a school that is seemingly uninterested in high achievement, and how do they need to be supported to continue to be effective in promoting students? In what ways do schools support teachers who give up their own time to champion these high-ability students? Furthermore, do the personality and professional characteristics of these Teacher-Mavericks align with those of their high-ability students? Teacher-student congruence has been shown to be an important factor in the success of high-ability students (Feldhusen, 1997). Mills (2003) suggests that teacher personality and cognitive style may play a role in his or her effectiveness in teaching gifted students, with highly effective teachers preferring themes and concepts that are abstract, in addition to demonstrating flexibility, objectivity, and showing openness.

It is possible that the Teacher-Catalysts and Teacher-Mavericks intuitively recognise these qualities in themselves and in their students, and that this could have influenced their efforts to support these students towards high academic success. This idea requires further empirical testing, and findings could assist principals in identifying teachers who would best meet the needs of high-ability students aiming for high academic success.

In contrast, the Teacher-Inhibitor's lack of support for student success may align with that literature identifying external factors that influence high-ability students' success (Feldhusen, 1997; Robinson, 2008; Vialle & Quigley, 2002; Vialle & Tischler, 2005). These international researchers suggest that gifted students have identified preferences for particular teacher qualities and included in these are many that the students in this study perceived as *lacking* in those teachers they considered to be inhibitors of their Scholarship access and success. These teacher qualities include intellectualism, subject matter expertise, a personal rapport with high-ability learners, and enjoyment of teaching them.

Alternatively, it may be that the students in this Scholarship study who were disappointed by the level of support they received from some teachers share those qualities highlighted by Reis et al. (2005) that are identified as protective factors that build educational resilience. Those protective factors Reis et al. (2005) have identified align with some of the findings that were also evidenced in this study where these New Zealand students of high ability also recognised the importance of supportive adults, friendships with other achieving students, opportunities to have advanced classes, participation in multiple extracurricular activities, their previous association with a gifted and talented programme and, the development of a strong self-belief that was evidenced in students' decisions pertaining to their future pathways. Perhaps the most significant finding of Reis et al. (2005) was the conclusion that one necessary protective factor for the development of resilience was the presence of at least one supportive adult. This finding appears to align greatly with the findings of this NZQA Scholarship study where students perceived that where they were unsupported by other teachers or school management, they each found one teacher – the Teacher-Maverick – with whom they formed a connection that ultimately led to their high academic success.

Although there is a growing body of literature that identifies characteristics of teachers of the gifted, it does not necessarily instruct students in ways that help them to manage a situation where they encounter a Teacher-Inhibitor. What processes or procedures are open to students who have their aspirations for high academic success, blocked? Other than the Teacher-Maverick, who else within the school supports these students? Consideration needs to be given to one other group of high-ability students who may or may not exist. This group are those students who

encountered Teacher-Inhibitors and did not find a Teacher-Maverick. What data are available that can identify these students, and, once identified, how can this situation be remedied? Do these students exist and who – if anyone – is supporting their aspirations for high academic success? The students in this study perceived that their families were supportive of them and that they expected them to be successful. What of those students whose families did not support them: are they present in groups of high-achievers? Do they accept lesser achievement and lower their expectations of success when they find themselves unsupported?

Reis et al. (2005) discuss support networks established within schools that can provide protective factors that contribute to the development of resilience factors in high-achieving students. These protective factors also align with some of those findings of this study. For example, Reis et al. (2005) identified the presence of friends and peers who also aimed for high academic achievement as a protective factor, and while this was true for some of the students in this Scholarship study, it was not true for all. This area pertaining to resilience and those factors that protect students is deserving of greater empirical investigation, perhaps most especially in those New Zealand schools that match the profile of those in which Reis et al. studied, where students are classified as "economically disadvantaged, ethnically diverse, academically talented" (p. 110).

Research not only describes mentoring programmes that have supported gifted students but also discusses the important place that role modelling can have in a mentor-mentee relationship, especially those established with students from low socio-economic backgrounds (Speirs Neumeister & Rinker, 2006). This study did not identify those people who specifically fill a role in which they are designated mentors. However, it appears that many New Zealand teachers perform these responsibilities that others describe as mentoring, including helping students to fulfil their potential and modelling life-long learning (Bisland, 2001; Speirs Neumeister & Rinker, 2006). Students perceive that their Scholarship teachers provided support that engendered high academic success. What remains unclear is whether these teachers were in fact mentors to these high-ability students or whether the role of mentor is intrinsic in those teachers who support high-ability students. Is this mentoring role the component that is missing in those teachers who inhibit access to high-achievement? Furthermore, one wonders if this is something that can be taught to teachers, a skill they can gain that will improve academic outcomes

for more high-ability students. This requires further testing and, if found to be an important component of the teacher's role, then a formal mentoring induction and training programme such as those described in the international literature (Rhodes & DuBois, 2008) ought to be introduced for all teachers who have contact with students aiming for high academic success.

The students in this study reported a number of learning opportunities that were based on their ability and not their age. These included early entrance to Scholarship and the NCEA material, in addition to gaining early entrance to university courses. This latter provision – known as dual enrolment – has been recognised in international literature as a means to promote improved academic outcomes for able students (Davidson & Davidson, 2004; Rinn, 2007). Not identified in this Scholarship study was the extent to which these New Zealand students were able to access university courses while at high school; for example, how many papers did they take and at what level were these papers? It is also unclear whether students were able to select courses across the whole university or were restricted to particular faculties. When these students chose early entrance to university, did they go alone or attend lectures with a group of high-ability high-school peers, ostensibly providing support for each other? It would be interesting to find out how readily available this type of learning opportunity is for high-ability students, and whether schools make this offer to students or students need to approach the school. Rinn (2007) suggests that some early entrance programmes enable gifted students to omit all or part of their high school years, thus entering university at an earlier age than would usually be expected. That was not a finding in this study, and it is not clear whether this is an option for high-ability students in New Zealand. However, further research – especially longitudinal research that provided evidence of student achievement following dual enrolment at university – could glean important information for schools, for high-ability students and for their parents as they work together to identify appropriate educational opportunities. Also unclear from this study is whether New Zealand students are being given the opportunity for curriculum compacting, described as a process whereby curriculum is condensed to enable the student to progress more quickly through the grades (Sullivan & Rebhorn, 2002). This aligns with the idea of early entrance to university and once again, is an area deserving of greater empirical research.

The second theoretical proposition is that there are multiple pieces that comprise the academic puzzle that represents success in NZQA Scholarship. This proposition may explain why some students persevered with their goal of Scholarship despite their perceptions that they encountered negative attitudes from teachers or school management. In contrast to their perceptions that the schools were not supportive, these students believe their family, their friends and peers did support them. They were confident that their families believed they would be successful in NZQA Scholarship, but it is not clear why they held such beliefs and from where they had stemmed. Did the beliefs come from their parents or from self actualisation? The level of a parent's education has been previously recognised as a factor in the success of gifted students (Bloom, 1985; Csikszentmihalyi et al., 1993). That was not tested in this study; rather students volunteered the level of their parents' education during interview. But one surprising aspect of student contribution was the role they saw each parent filling, with the father providing much of the academic support and the mother providing the environment that was conducive to study. One has to wonder: where did these beliefs come from? What is happening within families that suggests the assigning of these roles? If a question pertaining to parents' roles in Scholarship preparation had been asked in the on-line survey (and not having appeared as a response to other questions), would the same response have been given? Would it have differed across quintiles and between genders? There appears to a paucity of gifted literature to support or refute these findings – that fathers hold academic knowledge and mothers the skills to make a home comfortable. However, one study that investigated gender and parents found that mothers had greater knowledge about the daily activities of adolescents than fathers (Updegraff et al., 2009). One can speculate reasons for this – perhaps some fathers are working longer hours than mothers or, in the New Zealand study, perhaps it is the oldest child in the family who is preparing for Scholarship so the father works with him or her while the mother devotes her time to the younger siblings – but as causal factors were not identified in this research, this is clearly one other area that requires greater investigation.

Friends provide moral support and competition that students in this research describe as important in engendering higher academic outcomes. Literature has suggested that gifted students learn best beside like-minded peers (Colangelo et al., 2004; Eckstein, 2009; Gross, 1994; Rogers, 2004 Schunk, 1987). This appeared to be true of a number of students in this study but not true for all students. As Reis et al.

(2005) identified, the presence of friends and peers who also aimed for high academic achievement serves as a protective factor. Yet it is important to note that there were students who preferred to work alone, and others who identified that working one on one with a teacher was best for them. Keen (2004) suggested that gifted students in New Zealand have experienced frustration working with peers who do not share their work ethos. That was not evident in this Scholarship study; moreover, it appears that students – rather than providing one collective description that is their perception of the role peers play in their success – provide descriptions of differing roles that peers may hold in high academic success. Those factors that determine these roles are not clear but perhaps once again, this is something that may pertain to students' gender, school quintile or interpersonal factors that influence student motivation.

There were students in this study who claimed they had not needed to study, because they perceived that they had the ability to pick up concepts quickly and this negated the need to prepare for Scholarship. One wonders if in fact these students were underachieving and whether their needs in terms of receiving an appropriate curriculum were being met. It would be interesting to compile a profile of these students and to follow them longitudinally to gauge whether they continued to show high academic success in examinations, to determine if these high-ability students continue as high-achievers or whether this self-described lack of challenge leads to disengagement and a perpetuated cycle of underachievement. There is research that suggests students' perceptions of ability relates more strongly to their perceived attainment value and intrinsic interest than to the perceived utility value (Eccles & Wigfield, 1995; Meyer et al., 2006). This Scholarship study also identified the importance students perceived in being interested and enthusiastic about their study, with many students linking this to the enthusiasm their teachers also had for these subjects. These findings align with international research that identified 'high academic intrinsic motivation' that is also termed 'gifted motivation'. Gottfried et al., (2005) and Alexander and Schnick (2008) share their understanding of what it is that motivates gifted students, separately concluding that this is complex and linked not only to socio-cultural factors but also to context and student motivational history. Similarly, this NZQA Scholarship research found that it was not only interpersonal factors that influenced students, but their connections with family, their peers, and – most importantly – their teachers.

A number of factors relating to high academic achievement have become apparent through this study, and these are addressed in Table 15. These relate to three key stakeholders in NZQA Scholarship: high-school principals, teachers and, students aiming for high academic success.

Table 15: Questions for stakeholders in NZQA Scholarship

Principals *In what ways do I…*	**Teachers** *In what ways do I…*	**Students** *In …*
…co-establish the goals of high achievement with our students and their parents, and make sure these goals are reflected in our community and with all my teachers?	…let students know I believe they will be successful?	…what ways am I able to identify those teachers who will support me in my goal of gaining Scholarship?
…ensure I select Scholarship teachers who demonstrate personality and professional characteristics commensurate with those identified in research and literature as being characteristics which facilitate high academic success in able students?	…encourage student discussion and interaction in my classroom?	…what ways am I going to gain academic support if my teachers are indifferent or unsupportive of my bid for Scholarship?
…demonstrate to my teachers and students that I value Scholarship?	…prepare myself to teach students of high ability?	…choosing my Scholarship subjects, will I base my decisions on my interest and enjoyment of subjects?
…provide professional development for all teachers and management to ensure they are cogniscent with the principles and practices that support the education of high-ability students?	…assist students to achieve 'Merit', 'Excellence' or Scholarship?	
…establish and maintain relationships with tertiary institutions to provide my most able students with early access to university?	… align my practice with literature that identifies teacher personality and professional characteristics that facilitate high academic achievement?	

Future Directions and Conclusions

The aim of this research was to identify those factors that high-ability students perceived to be the reason they were successful in NZQA Scholarship. The goal was to identify some indicators for high-ability students, their teachers and their schools that provided suggestions for ways in which they could facilitate high academic achievement. These indicators were grounded in evidence and supported by

theoretical propositions and literature. Indications are that although some factors have been identified, there are many more aspects to this study that require further longitudinal research to help reveal meaningful relationships between students and their teachers, their families, their peers and those intrapersonal factors that explain the beliefs students hold about what it is that influences their motivation.

Nonetheless, this study has implications for high-ability students, their teachers, and school management. Screening that takes into account a teacher's ability to not only demonstrate their willingness to work with high-ability students, but also share with these students a preference for themes and concepts that are abstract, in addition to demonstrating their ability to be flexible, objective, and open, is long overdue. Clearly, not every teacher who works with high-ability students is suited to this role. Professional development that focuses on developing teachers' capability and awareness of those factors identified as factors that facilitate high academic success is also important. Literature has identified that teachers of the gifted and gifted students' characteristics are often aligned (Feldhusen, 1997; Mills, 2003) and knowledge of these characteristics may assist principals to identify those teachers who can best meet the needs of their most able students.

This study has identified a relationship between high-ability students demonstrating a willingness to spend time studying subjects in which they believe they can be successful, and that student perceptions of the importance of interpersonal factors can relate to students' gender. Perhaps most significant was the students' perspective on those factors they need in order to excel. These include family support, some peer and friend support, and most importantly of all, they need knowledgeable teachers who have expectations of high academic success for their students. They recognise that they need teachers who are able to share with their students their own enthusiasm and interest for a subject, and these factors help students to persist in their studies because they too are interested in what they are learning. Further research into those factors that determine student resilience could provide a focus for improving academic outcomes for high-ability students who perceive they are not receiving the support they need in order to attain high academic success. Finally, further investigation of the dimensions of successful student-teacher relationships could identify how these connections are established and how they can be promoted and nurtured in other students of high-ability and their teachers, thus providing a new and promising direction for the education of high-ability students.

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Appendices

Appendix A

Zigzag Data Collection and Analysis to achieve Saturation of Categories

(adapted from Creswell, 2008)

Data Collection	Topics Arising from the Data
2008:Teacher interviews 1 & 2	• In-school teacher professional development • The school's internal approach to Scholarship • Influence of peers/family/friends/teachers • Learning environment
Close to saturated 2008: 2nd round of interviews	• School contact post Scholarship • Valuing of Scholarship – school & student
2008: 1st round of Student interviews	• Teacher attributes • Scholarship classes • Learning environment • Decision to go to university • Influence friends/family/peers • Study routine • Delay in gratification • Motivation orientations • Role of monetary incentive • Source of Scholarship information • Enrichment work/classes
2007: 4th and subsequent Student interviews (Pilot Study)	• Teacher - Classroom environment Pedagogy • Influence friends/family/peers • Motivation orientations
2007: 1st, 2nd and 3rd Student interviews (Pilot Study)	• Teacher • Motivation orientations

Appendix B:

Indicative Student Interview questions for Semi-structured Interviews

Can you describe a successful Scholarship teacher?

How do successful teachers manage class discussions?

In what ways did the teacher teach – white board and pens...?

What role –if any- did your friends or peers play in your success?

What role do you think family's play in students' success?

During study week did you give up other activities in order to study?

What role do you think family play in students being successful?

What sort of things do families say or do to let students know they support them?

Do you think it's more important family believe you'll be successful, or your teachers?

Do you think the money offered for Scholarship was an incentive for students to sit?

When do you think people decide to go to university?

Were you in any gifted or enrichment classes at school?

Appendix C

Project Title: Factors Influencing New Zealand's Top Students' Academic Ach...

Welcome! This survey ought to take you no longer than 20 minutes to complete.

As you indicated on your consent form, you understand that as a participant you have the right to:
- Decline to answer any particular question;
- Withdraw from the study at any time prior to data analysis (24 May 2008);
- Ask any questions about the study at any time during participation;
- Provide information on the understanding that your name will not be used;
- Be given access to a summary of the project finding when it is concluded.

SECTION 1

This section contains descriptive information

1. National Student Number:

2. Name of school:

Descriptive information contd.

3. Gender

☐ Male

☐ Female

4. Student Status

☐ Domestic NZ/permanent resident

☐ International

5. In 2007 it became possible to have your NCEA certificate endorsed with an overall grade. If you gained an overall endorsement of Merit or Excellence, please indicate in the boxes below.

	Merit	Excellence
Level 2	◯	◯
Level 3	◯	◯

SECTION 2

In this section I would like to find out more about you. For each question, please check the boxes with the answer that is most correct for you.

6. Which of the following awards have you attained? Tick as many boxes as applicable.

- [ ] Single Subject Award(s)
- [ ] Top Subject Award
- [ ] Scholarship Award
- [ ] Outstanding Scholar Award
- [ ] Premier Award

7. Please specify the subject or subjects that you gained an award for.

Single Subjects Award (s)	
Top Subject Award	
Scholarship Award	
Outstanding Scholar Award	
Premier Award	

More about you contd.

8. When did you decide to attempt Scholarship?

- [ ] Term 1 of the year I sat Scholarship
- [ ] Term 2 of the year I sat Scholarship
- [ ] Term 3 of the year I sat Scholarship
- [ ] During the year previous to the one when I sat Scholarship
- [ ] Other (please specify)

9. On average, about how many hours per week during study leave in the year you sat Scholarship did you spend preparing for Scholarship examinations?

- [ ] Up to 5 hours
- [ ] 5 – 10 hours
- [ ] 10 – 20 hours
- [ ] More than 20 hours

SECTION 3

This set of questions relate to my interest in learning about the people and things that may have influenced your success in Scholarship.

Please rate the extent of the possible influence using the scale provided by checking the box beside the number that most closely matches your opinion.

1 = no influence at all
2 = this had a little influence on my successful results
3 = this had some influence on my successful results
4 = this was a big factor in my successful results

10.

	1	2	3	4
My ability in the subject (s) influenced my success	☐	☐	☐	☐
The effort I put into studying for scholarship influenced how well I did	☐	☐	☐	☐
The interest and enthusiasm I had for the subject influenced my success	☐	☐	☐	☐
Luck played a part in my success	☐	☐	☐	☐
My persistence in studying and working hard played a part in my success	☐	☐	☐	☐

SECTION 4

Please choose and rank the three people who had the greatest influence on your Scholarship results (1 = greatest influence).

11.

teacher(s)	
mother	
father	
sister	
brother	
other family member	
mentor	
friend	
friends	
principal	
coach	
other	

12. If you answered 'other' please specify who this person was (e.g. my grandfather)

SECTION 5

This question asks you to consider the greatest OVERALL influence on your successful Scholarship results.

13. Consider all the previously mentioned factors that influenced your successful Scholarship results (ability; effort; interest and enthusiasm; luck; persistence; or any of the people who influenced you) and select the ONE factor or person that you feel was the GREATEST OVERALL influence. Please explain your choice.

SECTION 6

Your answers to these questions will help me to understand more about the 'you' factors that impacted on your success. Please indicate by checking the most appropriate box.

14.

	not at all true	mostly not true	sometimes true	always true
The subjects I gained success in are subjects that are valued in my culture	☐	☐	☐	☐
I found it easy to understand the subjects I gained scholarship in	☐	☐	☐	☐
Compared to most other students at my school I find academic tasks relatively easy	☐	☐	☐	☐
I find it easy to concentrate in subjects I am interested in	☐	☐	☐	☐
I enjoy and welcome new experiences (e.g. challenges)	☐	☐	☐	☐
During the year I sat Scholarship, my teachers thought that I was a strong student academically	☐	☐	☐	☐
I expected to get Excellence or at least Merit when I did NCEA	☐	☐	☐	☐
I always find time to study the subjects that I think I will be successful in	☐	☐	☐	☐
In NCEA Levels 1, 2 and 3, I took subjects that allowed me to try for Merit or Excellence, rather than just Achieved	☐	☐	☐	☐
I think being successful in Scholarship is important for my future goals in life	☐	☐	☐	☐
I strive for Merit or Excellence even when I don't need this to achieve my goals	☐	☐	☐	☐
Some people find they need to give up social activities during study break, to help them focus on study. Was this true for you?	☐	☐	☐	☐

SECTION 7

This section looks at some of the people who may have assisted your success.

15.

	not at all true	mostly not true	sometimes true	always true
My family are supportive of my study for Scholarship	☐	☐	☐	☐
My parents expected me to achieve Scholarship	☐	☐	☐	☐
My teachers were supportive of my study for Scholarship	☐	☐	☐	☐
My teachers were knowledgeable in the subjects I gained Scholarship in	☐	☐	☐	☐
My teachers expected me to succeed in Scholarship	☐	☐	☐	☐

SECTION 8

This section looks at your activities and interests during the past 3 years. Please list any extra curricula activities you were involved in.

16. Please list any activities you were involved in during your last 3 years at high school.

Athletic activities e.g. sports	
School clubs e.g. debating	
Performance clubs e.g. choirs, kapa haka	
National or international teams	
Competitions	
Special/advanced/accelerate classes	
Part time employment	
Community work	
Church	
Other	

17. If you answered 'other' please specify what this activity was.

Organised Activities

18. In a typical week, estimate how many hours you might spend on all the above kinds of organised activities?

	Year 11	Year 12	Year 13
Athletic activities e.g. sports			
School clubs e.g. debating			
Performance clubs e.g. choirs, kapa haka			
Leadership role(s)			
National or international Teams			
Part time employment			
Community work			
Church			
Other			

19. If you selected 'other' please name the activity and specify the time spent on it in a typical week.

SECTION 9

Please list any awards or achievements you were recognised for in your last 3 years at high school, including any leadership opportunities you have had.

20.

Year 11

Year 12

Year 13

SECTION 10

This final section asks you to describe your current plans for the future.

21. Now that you have attained Scholarship, what are you most likely going to do? Pick up to three things on the list below with:
1 = first choice
2 = second choice
3 = third choice
(n.b enter only numbers - no letters)

Go to university	
Attend another tertiary education programme like a polytechnic or wananga	
Enrol in a vocational programme to prepare me for work	
Work full time	
Work part time while I decide what to do	
Travel, maybe overseas	
Get married and/or start a family	
Just hang out while I decide what to do	
Go overseas for a while, then do a tertiary degree here in New Zealand	
Go overseas to work indefinitely	
Go overseas for tertiary study	
Do professional sports full time	
Continue with my high school/college studies (i.e. Year 13)	
Other (please specify)	

You're done!

22. You're done! Thanks so much for taking time to complete this questionnaire. Please use the box below to add any additional information you would like to include.

Appendix D

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

Monday 07 April 2008

Dear Student

My name is Jenny Horsley and I am a PhD student at Victoria University. Following your success in the 2007 Scholarship examination, I would like to congratulate you and invite you to participate in research that considers the range of factors that have facilitated the achievement of New Zealand's gifted and talented students. The purpose of this research is to help gain a better understanding of the things that have assisted or inhibited Scholarship examination success.

You are being asked to complete this on-line questionnaire on a voluntary basis as someone who has achieved at a very high level in the New Zealand education system. I have included a consent form which requires your signature if you agree to participate. Any information you provide and your answers to the questionnaires will be kept confidential and only I will know your identity for purposes of coding the data. On the consent form I have also asked you to indicate your willingness to be contacted for a follow-up telephone interview. This questionnaire and the project have been reviewed and approved by the Human Ethics Committee at Victoria University of Wellington, and form part of my PhD.

All data gathered for this research remains confidential. You will not be identified in the research report, as each participant and school will be given a pseudonym, or unique identifier. Data will be stored in a locked filing cabinet or will be password protected on a computer. The consent forms and information used will be retained in secure archives for three years at which time it will be destroyed. Data will be collated and presented to Victoria University in standard thesis format. A summary of the research will be available following the completion of the thesis. I will contact each participant through email or directly to advise them when this is available. The data collected will be used for the purposes of this research and any other publications or presentations which may arise.

As a participant, you have the right to:

- Decline to participate
- Decline to answer any particular question
- Withdraw from the study at any time prior to data analysis
- Ask any questions about the study at any time during participation
- Provide information on the understanding that your name will not be used, and
- Be given access to a summary of the project finding when it is concluded.

If you agree to participate, please sign and return the enclosed consent form. Once I receive your consent form I will email to you the web address of the on-line survey. I am happy to discuss the research with you upon your request. If you have any questions, please contact me at 04 463 9704 or jenny.horsley@vuw.ac.nz. Thank you very much for your assistance, and I look forward to your response by the due date of Monday 28 April 2008.

Yours sincerely

Jenny Horsley

Appendix E

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

CONSENT TO PARTICIPATE

Title of project: **Factors Influencing New Zealand's Top Students' Academic Achievement**

I have read the letter and information regarding this research project, and give my consent to participate in

☐ an on-line questionnaire
☐ an interview *(Please indicate)*

☐ I agree to have the interview audio taped and transcribed then emailed to me for verification.
☐ I do not agree to have the interview audio taped but understand that notes will be made during the interview that will be transcribed then emailed to me for verification.
. *(Please indicate)*

I understand that by signing this consent form, I give the researcher permission to access my NZQA results. I also understand that as a participant, I have the right to:

- Decline to participate
- Decline to answer any particular question
- Withdraw from the study at any time prior to data analysis (Friday 30 May, 2008)
- Ask any questions about the study at any time during participation
- Provide information on the understanding that my name will not be used, and
- Be given access to a summary of the project finding when it is concluded.

NZQA Number:		
Signed:		
My name: *(please print clearly)*		
Date:	Email address:	Telephone:
Telephone interviews will be conducted during the months of May and June. Please indicate the day(s) that would be most convenient for you to be interviewed. _____on _____ (days of the week).		

Please return to the researcher in the stamped addressed envelope ***by Monday 28 April 2008.***

Appendix F

Athletic Activities These sports included those identified in the pilot study: aerobics, archery, athletics, badminton, basketball, cheerleading, cricket, cross country, croquet, cycling, dragon boating, fencing, fitness, futsal, gym, hockey, indoor sports, marching, mountain biking, multi-sport, netball, orienteering, road cycling, rugby, running, rock climbing, soccer, softball skiing, surfing, swimming, table tennis, taekwon-do, tennis, tramping, triathlon, volleyball, waka ama and water polo. In addition students also named: ballet, chess, Chinese martial arts , dance, darts, equestrian, fencing golf, jogging, lacrosse, lawn bowls, petanque, rock climbing, skateboarding, small bore shooting, snowboarding, squash, surf lifesaving, table tennis, touch rugby, tramping, triathlon, underwater hockey, water skiing, windsurfing and yachting.

School Clubs (e.g. debating). Again, this included all those clubs listed in the pilot study: Amnesty International, Asian cultural group, badminton team, chess, creative writing club, debating, Duke of Edinburgh, French and History European tour group, film club, glee club, Jazz Band, librarian, O'Shea Shield competition, paintball, Peer support, Physics Club, SADD committee, SAFE, Shakespeare soiree, social awareness committee, Stage Challenge, Tech Angels, Theatre Sports, tutoring club, writing group, Young Enterprise scheme, with the addition of: Amnesty club; Christian groups; drama; environment; film society; future problem solving; mooting; oratory; robotics; school committees; school magazine, school newspaper, school ball, cultural, World Vision, social and graduation committees; and Stage challenge.

Performance Clubs (e.g. kapa haka). Those clubs identified in the 2007 pilot survey were again listed by students: chapel band; chapel choir; choir(s); dancing; glee club; jazz bands; junior drama; Kapa Haka; orchestra; recorder group; rock band; saxophone quartet; school production; senior drama; Stage Challenge; and symphonic bands. Students also named: bands: symphonic, youth, rock quest, air, pipe; chamber music; choirs: gospel, barbershop, festival, Broadway, chorale; cultural groups: Samoan, Indian, Chinese; dancing including: hip-hop, jazz, ballet, salsa; fashion shows; Military tattoo; modelling; musical theatre; orchestra; public speaking; a variety of music lessons: handbells, sax, guitar, piano, flute, drums, recorder, flute, viola, violin; and WOW.

National or International teams It was not possible to name all the activities students listed as in some cases, they were the only representative and this may have made them identifiable in this research. Many of these sports were national events and a number were international events. They included: Cricket, Debating, Dragon boating, Fencing, Free-ski, Future problem solving, global enterprise NZ, hockey, Karate, Kung Fu, Lacrosse, Lawn bowls, N.Z. Youth C.H.O.G.M, National Manu Korero [3]competitions, NZ delegation to The Hague International Model United Nations 2008, NZ trampoline team, NZ Trans Tasman swimming development squad, Orchestra, Orienteering, Physics debating squad, Shakespeare drama group, soccer, squash, table tennis, tennis, underwater hockey, yachting, youth media summit and youth parliament.

Competitions Many of these activities have been mentioned in previous sections but examples are given under the following headings:

i. Sporting Competitions (e.g. rowing; badminton; underwater hockey; surf lifesaving)
ii. Academic competitions (e.g. Australian competitions; Economic competitions; Bell Gully poetry; Reserve Bank Monetary Policy Challenge)
iii. Cultural competitions (e.g. Sheila Winn Shakespeare; Manu Korero speech competitions; Stage Challenge)
iv. Musical competitions (e.g. Big Sing Competition;
v. Other (e.g. Duke of Edinburgh)

[3] The Ngā Manu Kōrero Speech Competition aims to encourage greater command and fluency of spoken English amongst secondary Māori students (http://www.maorieducation.org.nz/mk/)