

# **Look who's talking?**

## **NCEA and learning partnerships**

### ***A case study of a lesson***

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## **ABSTRACT**

This dissertation provides a 'snapshot' of one teacher's response to the National Certificate of Educational Achievement (NCEA) in terms of their classroom practice. If New Zealand secondary schools are going to respond to the ideal that NCEA will promote life-long learning, help students to participate and benefit from further study, acknowledge achievement across a range of learning fields and articulate expectations of learning goals, then it is expected that they will inspire a change in the pedagogy of their teachers (Ministry of Education, 2004). The quality of the interactions between students and their teacher is one crucial link in fulfilling the purpose of NCEA, to develop for students the skills of life-long learning. This snapshot demonstrates that NCEA students in one class have not evolved the skills for life-long learning. Therefore this dissertation suggests that a widespread educational focus on building life-long learners be promoted, that professional development to develop this be provided, and that further research be targeted at the specific strategies that learners use when interacting to improve their understanding if the potential to promote life-long learning through NCEA is to be realised.

This study considered how a teacher had responded to the changed nature of assessment brought about by the introduction of NCEA. A case study methodology was employed and data was gathered through a video, a questionnaire, a focus group interview and a key informant interview with the students and teacher of one NCEA class in a South Auckland secondary school. The research tools were a written questionnaire requiring written responses and two sets of discussion questions.

From the literature, key ideas about the importance of student interaction emerged which formed the reference frame for the analysis of the data. These were that students and teacher needed to establish a partnership focused on learning (Absolum, 2006), that students needed to make their own sense of the ideas being learnt (Bishop & Glynn, 1999), that students need to be motivated and collaboratively engaged in the learning (Black & William, 1998; Bruner, 1996; Hattie, 1999). The literature confirmed that the social nature of the classroom is hugely influential in focusing student attention on or off the curricular content of the lesson (Cowie, 2004).

This dissertation affirms previous research in the response of New Zealand teachers to the change to NCEA and draws on change management theory to make recommendations. It suggests that the pedagogical principles of growing life-long learners, signalled by the

Ministry of Education as one of the aims of education and of NCEA, be widely promoted throughout the educational system to embrace pre-service and in-service teacher education and to be driven by secondary school principals and boards. The study also sets the scene for further in-depth research into the nature of student learning conversations if they are to signal a growth in cognitive engagement and assist students to be autonomous life-long learners.

## **Acknowledgements**

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# Abbreviations

## ***List of Abbreviations Used***

CBA	Competency-Based Assessment
ERO	Education Review Office
MOE	Ministry of Education (New Zealand)
NCEA	National Certificate of Educational Achievement
NQF	National Qualifications Framework
NRT	Norm-referenced testing
NZCER	New Zealand Council for Educational Research
NZPPTA	New Zealand Post Primary Teachers' Association
NZQA	New Zealand Qualifications Authority
PPTA	Post Primary Teachers' Association
SBA	Standards based assessment
UK	United Kingdom
USA	United States of America

## ***Coding used to describe the research results in Chapter 4***

**S2** – student number 2

**SQ2** – student number 2, questionnaire data

**S13FG** – student number 13, focus group interview data

**TB6IA**- teacher, behaviour interaction number 6, interaction analysis data

**TVKI**- teacher, video, key informant interview data

**TQ4KI**- teacher, question 4, key informant interview

# CHAPTER ONE

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## *Introduction*

NCEA is said to be about promoting life-long learning, helping students participate and benefit from further study, acknowledging achievement across a range of learning fields, engaging in and interacting with learning opportunities, and articulating expectations of learning goals. While the introduction of NCEA was supported by professional development around assisting teachers with the different nature of the assessment processes, the corresponding support for changed classroom practices has so far not happened. If a widespread educational focus on building life-long learners is to be promoted throughout all levels of the New Zealand education system, then there needs to be underpinning clarification of just what this phrase of life-long learning means. If students are to learn better, then it corresponds that they need to be taught better. This chapter outlines the purpose for this study and presents the aim and objectives of this dissertation and provides a brief description of the research method.

## **Background to research**

New Zealand formerly had a norm-referenced end-of-school set of qualifications known as School Certificate and Bursary, offered during Years 11 and 13 of compulsory schooling. This norm-referenced assessment compared students' achievement against other students and the system ranked these students according to their marks, grades or percentages. The normal distribution curve was 'all powerful' and the actual score a student achieved was adjusted to lie within this, ensuring that a set proportion of scores sat within the top and bottom grades and the bulk of the results sat around the middle. It has been recognised for a long time that there were both benefits and issues with this qualification and the Thomas Report of 1944 and the Currie Report of 1962 illustrated the negative consequences of norm-referenced external examinations.

Concerns around a norm-referenced system relate to the significant failure rate of approximately 50% of the student population who despite being products of the state education system, left school with no qualification. In addition, these students were more likely to enter adult society disengaged with learning and the repercussions of these attitudes could be seen borne out in families and homes where education and advancement were not aspired to. More than this, a system that 'guarantees' to pass the top 50% of students, irrespective of what they have actually learnt can act as a powerful

disincentive for less able students to achieve and for teachers to strive for quality teaching and learning. Even with brilliant self-referenced learning, unless a student can climb into the top 50%, they will fail and none of their learning will be recognised. These outcomes of the norm-referenced system were not fulfilling the Ministry of Education's aims for education which in 1962 were, to provide the means of equality of opportunity for all.

Conversely, the norm-referenced system was a trusted and established qualification system, well understood by employers and families. The New Zealand educated adult population were products of this system therefore the long term public appeal was based on common familiarity. For the 50% of students who achieved at least some success and a qualification, there was probably a positive attitude to learning and a natural by-product of this would have been evident in their support for educational advancement.

The National Certificate of Educational Achievement (NCEA) was introduced to New Zealand secondary schools in 2002 and offers a different type of end-of-school qualification. While the previous assessment system recorded a student's qualification as School Certificate, with one percentage result and one overall grade per subject, the 'new' or current assessment system offers students a National Certificate of Education Achievement, which details a student's achievement across units of study within each subject. This change was not just in the name of the qualification and the quality of the result, but in the entire nature of the assessment process that determined it. NCEA uses standards-based assessment to compare a student's performance against pre-determined criteria, and in this process every student who is capable of reaching the criteria is deemed to have succeeded.

### **Research problem and aims and objectives**

If NCEA uses a different form of assessment to the previous qualifications' assessments, then it may well have implications for the way teachers teach. The expectation that NCEA will support a changed approach to teaching practice has been detailed by the Educational Review Office (2004), Irwin (2000) and the Ministry of Education (2004), in direct response to the standards-based nature of assessments in secondary school classrooms. There is therefore a need to describe the actual classroom practices that might make sense to use within the context of standards-based assessment.

If a student's performance is to be measured against pre-determined criteria then only by

knowing those criteria will students be able to know whether they are progressing towards success and what they need to work on. Therefore teachers will need to work in such a manner with students as to enable students to know what these criteria are and the state of their progress towards the Unit or Achievement Standard.

The strategies of formative assessment have been shown to raise student achievement particularly in a standards-based environment and the study by Black and Wiliam of United Kingdom secondary teachers describes the impact of this approach to teaching and learning (1998). There is not, however, a corresponding New Zealand study which demonstrates any link between these formative assessment strategies and improved learning in NCEA. "The field of student learning remains wide open for future research" (McGee, 2001, p.17). McGee asserts a desire for further research into pedagogy, and in the NCEA environment this has not yet been forthcoming therefore research is timely.

In their research of classroom discourse prior to NCEA, Bishop and Glynn (1999) observed classrooms that tended to be dominated by traditional teacher-led discourse. Yet the effective teaching practice described by Absolum (2006), Black and Wiliam (1998), Crooks (1998) and the Ministry of Education (2003) argue for a more collaborative learning process in which the students take an active part in defining what is to be learnt, the manner in which they learn it and the assessing of it – all with the aim of increasing their achievement. This notion of a collective and collaborative effort is also detailed in the Ministry of Education's Schooling Strategy (2005). When describing this collaborative learning process Stoll, Fink and Earl (2003) detail how people learn from each other, through the conversations they have about their learning. It would seem therefore, that if the change to NCEA is actually to result in improved achievement, the nature of classroom conversation might need to change.

## **Aims**

The aim of this project is to investigate the quality of the interactions between students and their teacher in an NCEA classroom, as evidence of self-regulating and motivated students in order to establish any link between what students do to enhance their learning, and what the research literature suggests are the most powerful strategies teachers and students could use to enhance the learning. The findings may have implications for the manner in which secondary school senior managers maximise the opportunity with NCEA to improve the achievement of their students and develop within them the skills to be life long learners.

## **Objectives**

1. to critically analyse the links between the research on assessment for learning and the interactions between the teacher and the students in one lesson in an NCEA class
2. to critically examine the presence or absence in an NCEA lesson of student-led interactions defined in the literature as learning-focused student interactions that can contribute to self-regulated learning
3. to identify a set of implications for senior managers of secondary schools regarding enhancement of the achievement of NCEA students through improving the pedagogy of teachers

## **Justification**

The Ministry of Education recognises that the formal assessment process itself is not the solution to enhanced student achievement, but that good teaching practice is also a crucial factor, as this has been signalled in literature around NCEA (Education Review Office, 2004; Ministry of Education, 2004; Irwin, 2000). To this end there has been funding for research into good teaching practice (MOE, 2003) and formal professional development and resource development around the nature of the new assessments in each of the curriculum areas (Starkey et al, 2006).

To reach the standard required by any NCEA qualification requires students to learn about

the concepts, skills and understandings to that standard. It follows that the better that all students are taught the greater the percentage that will gain the qualification. So what does good teaching in a standards-based system look like? That is what this research will describe. There is a lot of literature around the nature of the strategies and practices that teachers can employ if they aim to grow self-regulating students and thereby enhance their potential for achievement (Ministry of Education, 2003).

## **Methodology**

After a brief examination of the requirements for effective educational research the reasons for a case study research methodology will be described. The case study will be small scale and descriptive as it aims to examine the learning conversations in one NCEA classroom to identify how closely a teacher's day-to-day practice aligns with the researched pedagogy that supports student achievement in standards-based assessments. Data will be gathered on this through video, a questionnaire, a focus group and a key informant interview. The research tools to be used are two sets of discussion questions and a written questionnaire requiring written responses.

This data will be analysed against the pedagogical findings from the literature study to see what extent students use effective strategies to help themselves learn and to what extent the teacher uses effective strategies to help them reach the required NCEA standard. The findings might provide small scale evidence of the need for further professional development in secondary schools if New Zealand students are to become life-long learners through their experiences with NCEA.

## **Outline of the report**

This dissertation presents the Literature Review in Chapter 2 which draws on the literature about the history of recent New Zealand educational change which signaled the shift the NCEA. It then examines the international literature around pedagogy which best compliments the standards-based assessments found in NCEA in order to define a pedagogy suitable for students' potential achievement with NCEA. Through an examination of literature on effective professional development and change management it intends to construct some guidelines for schools to raise student achievement in NCEA.

Chapter 3 will examine the methodology of this research and explore the research design,

the research methods, the validity and the ethical considerations. The results of this case study will be examined in chapter 4 and the analysis of these results and the recommendations of this research will be outlined in chapter 5.

## **Definitions**

The terms learning conversations, interactions, classroom discourse and collaborative discussions all refer to the conversations between students and their teacher in the process of the learning that occurs in the classroom. Interaction is described by Wagner (1994) as the conversation or event that takes place between a learner and the learner's environment, which in terms of this research will be the people in their classroom.

**Achievement Standard:** a nationally registered, coherent set of learning outcomes and associated assessment criteria, together with technical and management information that supports delivery and assessment; achievement standards specify three different standards of performance and the method of assessment, which may include external assessment.

**Unit Standard:** a nationally registered, coherent set of learning outcomes and associated assessment criteria, together with technical and management information that supports delivery and assessment. All unit standards are registered on the National Qualifications Framework, assigned a level and a credit value, and may contribute to the award of a National Certificate or Diploma.

Abbreviations are translated on page 6 as is the coding method used for describing the results in chapter 4.

## **Conclusion**

McCallum, Hargreaves and Gipps (2000) also support Black and Wiliam's conclusion that collaborative discourse can lead to significant gains in learning. Therefore, perhaps the more opportunities there are for classroom conversations about learning, the better. At present we do not know what links there are between the student conversations either with their teacher or with each other and the researched suggestions of effective learning strategies. Do teachers and students in NCEA classrooms actually do what the research

says they should if the potential of NCEA is to be realised? If we are to demonstrate that such student actions do enhance student learning and achievement we would need some form of evidence from an observation. For enhanced achievement under NCEA it makes sense to have alignment between learning, teaching and assessment, and there is an urgent need for further research. McGee (2001) states that we need to investigate these challenging issues using multiple research methods, observations of and conversations with teachers and students in classroom settings

# CHAPTER TWO

## **CHAPTER TWO**

### ***Literature Review***

#### **Introduction**

This chapter builds for my research argument, a base of credible research that argues that there is a case for a change to the way students and teachers work if they are to maximise the achievement opportunities in New Zealand secondary schools. To begin with I shall describe what the National Certificate of Educational Achievement is, and what its purpose is, as an introduction to the context of this study. This will be followed by a summary of the history behind this change to New Zealand's national secondary school qualification, and will show how a groundswell shift towards the use of standards-based assessment was happening long before New Zealand Qualifications Authority established NCEA.

I shall then look at some of the extensive international literature that supports standards-based assessment, which is the primary type of assessment found in NCEA, with a view to illustrating how this type of assessment is congruent with pedagogical principles generally referred to as formative assessment. Through this data I intend to construct a case around the value of an insitu observation in order to sample the nature of the learning conversations in an NCEA classroom. This will either support or contest the growing evidence of the response secondary teachers have made to the introduction of NCEA mentioned by ERO (2004) and Starkey et al (2006).

I shall then examine the literature base around professional development and change management in order to build a case for what the response from schools could be if they are to maximise the opportunities for raising student achievement with NCEA. This will then lead to the establishment of a series of research questions about what needs to happen in schools and classrooms if the potential benefits of NCEA are to be realised.

## **The Literature Base**

The establishment of a standards-based national qualification for secondary schools has been an original and challenging project for the NZQA and the MOE. The literature signalling this new qualification has come from researchers, policy analysts, government agencies and political bodies. The history and purpose of the change spans about 30 years and has been researched by educational academics. The literature in this section also draws on the publications of the Ministry of Education and the Education Act which have been helpful in documenting the change.

The pedagogical implications of NCEA are drawn from an international and national educational literature base which examines the nature of standards based assessment in fully involving the student in the learning process. The research around formal professional development and change management draws on international findings about how to build an enduring learning organisation.

## **Status of NCEA in Secondary Education in New Zealand**

NCEA, or the National Certificate of Educational Achievement, is New Zealand's national qualification for secondary school learners. It is one of more than 800 qualifications on New Zealand's National Qualification Framework (NQF) used throughout secondary, tertiary and industry training. NCEA is primarily delivered by secondary schools. NCEA is made up of three levels which replace the previous norm-referenced secondary school qualifications of School Certificate, Sixth Form Certificate and University Bursary. It is seen as providing a pathway to tertiary education and workplace training.

NCEA provides three levels of qualification, each level in itself recognising student attainment on this national qualification system. NCEA is made up of credits in a combination of Achievement Standards and Unit Standards. These credits are attained through a combination of internal and external assessments. In 2002 NCEA Level 1 replaced School Certificate. In 2003 NCEA Level 2 replaced Sixth Form Certificate. In 2004 NCEA Level 3 replaced University Bursary. Students will be awarded a certificate when they have accumulated sufficient credits by being successfully assessed against the National Qualifications Framework (NQF) NCEA standards.

ERO (2004) suggest that intended benefits of the move to the new qualification and assessment framework include:

- access to a range of qualifications that cater for abilities and aspirations of all young people and the anticipated needs of the community and the economy;
- rationalisation of qualifications and assessment practices for conventional school subjects;
- a single coherent system of national qualifications;
- improved coherence between curriculum and qualifications; and
- reduction of teacher workload through the elimination of dual assessment and the introduction of externally assessed components in conventional school subjects, together with new moderation procedures. (p. 4)

ERO (2004) has illustrated the benefits of the NCEA assessment system. What they has failed to identify is the standards-based nature of the assessments and the impact that these may have on the nature of the teaching and learning process. I endeavour to examine the key factors that caused the change to this qualification system with an aim to highlight those more significant factors and their implications for teachers and students.

### **Historical Background to NCEA**

The background to NCEA begins with the wide ranging social and economic reforms which took place in New Zealand following the political shift of the fourth Labour Government in 1984. The educational reform in the late 1980's involved dis-establishing the Department of Education and regional education boards. A number of government agencies were established instead, among them, the Ministry of Education (MOE) and the New Zealand Qualifications Authority (NZQA). The Ministry of Education's role was to develop policy advice for the Minister, and to monitor policy implementation rather than providing both policy advice and implementation as the previous Department of Education had done (McKenzie, 1992). In July 1990 the Qualifications Authority was formed and was charged with the development and implementation of a framework of national qualifications in secondary and tertiary education and training.

The development of the New Zealand Curriculum Framework: Te Anga Mātauranga o Aotearoa arose out of the 1989 Education Act. Published in 1993 by the Ministry of Education, the framework set out the policy direction for the entire New Zealand school curriculum. It included the principles which underpinned the curriculum, seven essential

learning areas, eight sets of essential skills and the values and attitudes which were to be reinforced throughout the curriculum. Through the 1990s the national curriculum statements for the seven essential learning areas which detailed what students were expected to learn in years 1-13, were progressively introduced. Also at this time the Maori Curriculum was developed, as an additional and much awaited learning area.

During this time, the New Zealand Qualifications Authority was developing a system that would integrate the qualifications offered by all New Zealand educational institutions, including schools, into a single framework. Roberts (1997) observed in his critique of the NZQA policy reforms, that the Qualifications Framework was fraught with controversy from the beginning. There was considerable debate about its suitability for school qualifications, and much of the debate around the framework was centred on its implications for university based education.

There was an additional debate around the suitable forms of assessment, which rested largely on dissatisfaction with the capacity of a single end of year examination to measure the full scope of a year's learning in a subject area for a student. Also of concern was the inadequacy of a norm-referenced assessment system for supporting and reporting on students' learning (PPTA, 1997; Lennox, 1995, Hall, 2000).

The New Zealand secondary teachers' union, the Post Primary Teachers' Association (PPTA) wanted to inform debate on what was becoming a controversial matter, so they commissioned an inquiry into the qualifications framework. The report, Te Tiro Hou: report of the Qualifications Framework Inquiry (PPTA, 1997) identified key themes which actually influenced the development of the qualifications on the Framework.

The three themes from the report were as follows:

1. If the traditional norm-referenced examination system of the past perpetuated a narrow focus on academic knowledge at secondary school then the new system needed to promote vocational subjects as well as academic subjects. This would enable New Zealand to obtain a competitive advantage through a broadly skilled and knowledgeable workforce.
2. The mismatch between the curriculum and the assessments of the existing qualification system for the 15-19 age group was seen as limiting the opportunity for students to stay on at school and gain a qualification. The qualification if they did get it, was not reflective of

what they knew and could do, so the new system needed to increase the participation of this age group in senior secondary school qualifications.

3. There was a need to motivate students and provide for students at risk of underachievement. The norm-referenced system failed approximately 50% of the students, and lack of motivation for further study is a logical consequence of such a system. The report argued that more vocationally oriented subjects and greater co-operation between schools and tertiary institutions would meet the needs of a wider range of students.

Lennox (1995:9) observed that there was a widespread belief that if assessment were carried out by the teachers themselves (internal assessment) instead of through external examination then more relevant education could be provided and more accurate information about students could be reported. This would be a good thing because the existing system was perceived as not addressing the relevance of assessment and qualifications reflecting the progress through the curriculum. It was also considered that if teachers internally assessed they would make closer links between the teaching, the learning and the assessment (Hall, 2000). The resulting continual process of internal assessment, feedback and further learning was seen as a useful mechanism for keeping students motivated and engaged on learning. Teachers would be able to respond to the learning need identified in the internal assessment and assist the students to progress towards higher achievement. Similarly, the idea of standards-based assessment was attractive as it did not promote the failure of a set proportion of learners like norm-referenced forms of assessment. As the PPTA stated:

“standards-based assessment is more desirable on educational grounds than norm-based assessment. The Inquiry therefore believes that New Zealand's qualifications system should place prime emphasis on assessment against standards: standards, which are defined as clearly as possible”(PPTA, 1997: 101-102).

The NZQA released the National Qualifications Framework (NQF) for public consultation in 1990. Lennox (1995) observes that concern was expressed by some schools over the authenticity of the consultative process as key policy decisions about things such as the use of standards-based assessment had already been decided prior to the consultation. In November 1991 the NQF was launched with eight levels of qualifications from Year 11 up to post graduate level. Levels 1-3 endeavoured to be as equally applicable to senior secondary schools as to vocational or trades training. Administered by NZQA, the NQF is a way of structuring all national qualifications. The National Qualifications Framework

(NQF) was designed to provide:

“Nationally recognised, consistent standards and qualifications.

Recognition and credit for all learning of knowledge and skills.”

(NZQA, 2005, <http://www.nzqa.govt.nz/framework/about.html>, p.1)

Qualifications on the Framework were based on units of learning known as unit standards. Unit Standards are bodies of knowledge required by vocational and business courses which describe what a student needs to know or what they must be able to achieve. The first Unit Standards were registered on the Framework in 1993. In 2001 Achievement Standards were also registered for school subjects. Achievement Standards are bodies of knowledge about school subject or academic subjects and also describe what a student needs to know or be able to achieve. Only schools can offer Achievement Standards whereas Unit Standards are principally offered by industry training organisations but are also offered by schools. “The NQF was intended to lead to the development of Unit standards and qualifications for sectors and disciplines that previously had no qualifications” (NZQA, 2005, p.3). The problems with the norm-referenced system were overcome with a replacement standards-based system in 1998. The MOE policy initiative ‘Achievement 2001’, (1998) described the new qualification for schools, the National Certificate of Educational Achievement (NCEA).

Achievement Standards were created for most conventional school subjects. Success in the Achievement Standards is recorded as not achieved, achieved, merit or excellence and is assessed through a combination of internal and external assessments. Success in Unit Standards is shown as achieved or not achieved and is fully internally assessed. Each standard, whether it be a unit or achievement one, is worth credits on the NCEA, and the NCEA is awarded at each level when a student accumulates 80 or more credits. The NCEA was introduced as the new system for senior secondary school qualifications in successive years; level 1 in 2002 replaced Schools Certificate; level 2 in 2003 replaced 6<sup>th</sup> Form Certificate; and level 3 in 2004 replaced Bursary.

“The National Certificate of Achievement is designed to cater for New Zealand students’ diverse interests, abilities and aspirations...It is a standards-based qualification system which encompasses both vocational and academic learning” (MOE, 2004, p.16). This statement supports the aims of the NZQA, (2005, p.3) as it recognises that the NCEA is designed to cater for diverse student interests and abilities and support vocational and academic learning, while the NQF intends to “improve competitiveness in the global

markets, to create a modern education system that would encourage life-long learning, and to increase skill levels in the labour force.”

Within the standards-based assessment approach each unit has explicit learning outcomes which use transparent criteria for achievement. This breaking down of bodies of knowledge into discrete packages has been widely criticized. Hall, (2000) and Strachan, (2002) detail the concern expressed in New Zealand educational research about losing the overall body on knowledge in a subject, for little packets of learning. R. Baker (2001) observes however, that the assessment standards described in NCEA are described in broader outcomes than unit standards and, as such are less likely to be criticised for potentially ‘atomising’ learning (p.7). Corresponding criticism rests around the serious defects in the comparability between schools, and issues of reliability of internal assessments. Hall (2000) observed that different critics within the education system are asking different questions and focusing on different features of the system.

Despite critics and the technical and professional challenges in the new system, the goals of Te Tiro Hou are largely met, at least in theory, by the new assessment and qualification system. With transparent criteria and achievable standards there is the potential for every student to achieve, the barriers to achievement are not inherent in the assessment system. Therefore the involvement of the students in the assessment process would seem a critical difference to the norm-referenced system and an essential advantage with NCEA (Crooks, 1988; Strachan, 2002). With these opportunities for achievement available to students now, what sort of teaching would best enable students to reach their potential?

### **Pedagogical Implications Brought About By NCEA**

In 2000 the Ministry of Education asked Professor Paul Black to evaluate the proposed NCEA system. In his report to the Ministry Black clearly signalled that the standards-based nature of the NCEA assessment system would require teachers to adapt their teaching practice (pedagogy). “Any change in the system will affect the ways in which teachers will explore and exploit the means for maximum reward” (MOE, 2000, p. 5). But Black signalled a stronger message when he said, “it is disingenuous not to explore the possibilities for [pedagogical] change”, and this is what this part of the literature review intends to do, to identify the pedagogy best suited to NCEA (MOE, 2000, p.5).

There are four features of NCEA which I consider could support improved pedagogy that leverages from the improved incentives for students to gain a qualification. This part of the literature review will examine the research around each feature to identify the practices that may best enhance the opportunities for students to maximize their achievement through NCEA.

- The lessening of the demarcation between academic and vocational courses of study by bringing them both under the same qualification framework may enable students to create qualifications with a combination of both academic and vocational courses of study. The bringing of the vocational courses under the NCEA umbrella may add to their recognition and valuing by the public. Also there may be a portability of courses with some parts of courses in vocational studies combining with academic studies. All this may mean that the NCEA qualification can be tailored to meet the diverse needs of students for unique qualifications.
- Student achievement may be more attainable because the registered Unit Standards and Achievement Standards are atomistic 'pockets' or units of learning which may enhance the capacity for students to learn
- Achievement criteria are clear and explicit for every Unit and Achievement Standard in a manner that was not at all present in School Certificate therefore students may find that achievement in NCEA is more realistic because they know precisely what is required to meet the standard
- Internal assessment is an important component of NCEA because it allows for the opportunity for repeat assessments and opportunities for improved learning and this may encourage the student to be more motivated to learn and to continue to improve their understanding

The first feature is that with NCEA there is a lessening of the demarcation between academic and vocational courses of study by bringing them both under the same qualification framework. The significance of this quality of NCEA lies in the increased opportunity for 'non academic' New Zealand students to gain a qualification while at school. Under the previous system of School Certificate, Sixth Form Certificate and Bursary there was not much opportunity to acquire a qualification in a vocational subject. For example, Higgins (2002) describes how the government in New Zealand from the 1990's established policies towards creating competitive environments in education and employment and enhancing individuals' access to these. In order for individuals to participate in and benefit from the rewards available in the knowledge economy they

needed to be highly skilled and qualified. The development of the New Zealand Curriculum Framework was one development in response to this political direction which attempted to clearly specify the knowledge, skills and values needed for a knowledge economy (Higgins, 2002). The other was the development of Unit Standards which improved the opportunity for students to have access to gaining a vocational qualification while they were still at school and their education was funded by the state (NZQA,1991a).

The NCEA qualification can be gained by taking a combination of both academic and vocational courses of study, depending on what best suits the student's needs. Whereas with the previous qualification system students were obliged to opt into a somewhat narrow range of five or six vocational or academic subjects, NCEA offers vastly more choice of subjects and of units within subjects. The choice is only constrained by each school's ability to resource the subjects offered. The wider choice of subjects available to students and the consequential potential for students to study that which interests them suggests students will be able to construct courses in which they can achieve success. This in turn might enable more students to gain qualifications. The responsibility for teachers and schools is to work with students to assist them to find an NCEA course that will meet their qualification requirements and appeal to what interests them. The Ministry of Education specifically states that they want "more school leavers gaining qualifications at or above level 2 on the National Qualifications Framework" (MOE, 2004, p. 41).

Anderman and Midgely (1998) consider the importance of choice with relation to personal interest. They support the concept inherent in NCEA where a student has the opportunity to choose their courses of study. These choices could be expected to be influenced by either personal interest, or curriculum needs for further education. Meyer et al (2006) in their research on the impact of NCEA on student motivation found this also "Students predominantly chose subjects because they were of interest to them and, secondly, because the subject was related to a future job or career goal" (2006, p.1).

If students are to be able to utilise the potential for personal success in such a flexible qualification system as NCEA then it would seem important for them to have self control and self regulation in their learning at secondary school (Eccles and Midgely,1989). Meyer et al (2006) consider the challenge for this with schools as their research showed the powerful influence of student motivation to succeed in NCEA rather than just doing sufficient to get by. So what Meyer et al's findings suggest is the need for schools to give students the opportunity to set goals, to make choices and have an influence on their own

learning. By creating goal oriented, confident students with a belief in their capacity to achieve and a desire to succeed, schools will be able to support students to make the most of the opportunity to achieve which is provided by the personalisation of the NCEA qualification.

NCEA was designed to cater for New Zealand's students' diverse interests both within and beyond schools. By bringing the industry based vocational qualifications of the unit standards under the same umbrella as the school based achievement standards there may have been a shift in the perceived status of courses. Millar (1999) reminds us, "...an original goal of the qualification framework was to design a single structure which did not distinguish in assessment methodology between so-called academic and vocational subjects. The rationale for this is that in a technologically advanced economy, practical and academic subjects are equally important (1999, p.7). Perhaps the public may have had greater trust and valued more highly school based qualifications rather than industry based ones. Or perhaps the values were reversed.

There is also the consideration when students combine courses of study to attain an NCEA qualification, that there may be some cross-portability. For example a hair dressing unit standard may require a student to pass a Unit Standard in communication skills, which may also be offered in the Achievement Standard of English. For example the Hairdressing Unit Standard US20929 Demonstrate Safe and Professional Practice in a Salon Environment, also requires that a student passes a Communications Unit Standard 56 Attend to Customer Enquiries. US 56 is actually similar to US1312 Give Oral Instructions in the Workplace, and US 1312 is accredited under the English curriculum's Oral Communication strand. So while the student could attain credits towards their NCEA for what they have passed in hairdressing, their NCEA record of learning may also acknowledge the cross – portability of the Oral Communication unit standard against the English subject.

This construct of a qualification tailored to the individual's requirements provides a challenge for schools to respond appropriately. In 2003 there were approximately 50,000 Year 11 NCEA candidates of whom 60% achieved an NCEA qualification at level 1 (MOE, 2005). Lee and Lee (2000) note that in the past approximately 60% of students passed School Certificate, therefore we cannot state that NCEA has made a change to student achievement, yet.

NCEA may indeed have been designed to meet the qualification needs of diverse learners, as the MOE (2004) publication “New Zealand Schools; a Report of the Compulsory Schools Sector, 2003” states. It has been designed to give recognition to the importance of generic, portable and transferable skills according to Fitzsimmons (1997), and Baker (2001) has described that the assessment approach of NCEA has been designed to be more seamless and integrated. All of which are meant to enhance students’ motivation to participate in a wide range of courses within school and, where relevant, the tertiary sector. Current data does not yet show any improvement in the percentage of students gaining a qualification since the introduction of NCEA. Therefore, for the students of New Zealand to maximise the potential for achievement that NCEA offers, certain conditions need to be in place.

In summary, the responsibility for raising student participation in and achievement through NCEA lies with teachers and schools who work with students to assist them to find an NCEA course that will meet their qualification requirements and appeal to what interests them. Schools therefore have the responsibility to:

- give students the opportunity to make choices
- give students the opportunity to set goals
- encourage and inspire students with confidence, with a belief in their capacity to achieve, to have an influence on their own learning

The second feature of NCEA which may have implications for the way teachers work in their NCEA focussed classrooms is around the presentation of the curriculum. The Unit Standards and Achievement Standards are ‘pockets’ or units of learning which means that they are more atomistic than the previous assessment and qualification system. Because they are smaller ‘blocks’ of learning the Unit and Achievement standards may be easier for some students to assimilate than a full year’s course would have been.

Black & Wiliam (1998), from their research in the U.K. about the impact of formative assessment on student achievement, found that teachers need to break the curriculum down into small bundles of knowledge, if the knowledge is to be effectively assimilated by the students. Meyer et al support this logic, “What needs to happen is for them to experience an incremental accumulation of “skills and knowledge” so that they develop a sense of self efficacy and will keep learning to learn” (2006, p.10). Therefore the ‘atomisation’ of the subject content into small pockets of learning may contribute towards the incremental accumulation of “skills and knowledge” in students and proceed towards

an ever expanding understanding of the subject and curricular content of their course of study. The importance of the teacher's knowledge and capacity to explore and reinterpret the subject matter into smaller relevant chunks has been re-identified by Black and Wiliam (2006) as of significant importance to effective pedagogy.

The compartmentalization of the subjects into Unit or Achievement Standards has been criticised by Hall (2000) and Strachan (2002) because it suggests to them a 'bricks without mortar' approach, where the bodies of knowledge in the separate units are not the same knowledge as that provided in a whole course of study under a norm-referenced system. If teachers are not on top of their subject it would appear fractured or less than the sum of the whole.

If the confined dimensions of the units enable students to have greater success with their achievement, then it could be argued that this in itself will be motivational to further achievement. Hattie (1999) describes the importance of clear and organised direct instruction, while Hawk and Hill (2000) found that presenting material in small steps and assisting students to build bridges in their learning helps to draw students into a topic, to gain their participation and to motivate them. This research suggests a vital role for the teacher in having sufficient curricular knowledge to be able to adapt the curriculum material to the learning needs of the students, to break the ideas down into small steps and assisting students to make links between the known and the new learning.

Meyer et al (2006) found that students who did not set ambitious goals were less likely to achieve NCEA success. Therefore the significance of the teacher's role in supporting and motivating students to set realistic goals is an important pedagogical implication. The Assessment Reform Group (ARG) in their 2002 paper on 'Testing, Motivation and Learning' have identified eight factors that enhance student motivation, one of which is the Goal Orientation and the importance of promoting learning goals rather than performance goals. Perhaps a part of a teacher's role with NCEA students is to help them set learning goals for the criteria within the units of learning if the students are to maximise the achievement opportunities available with this form of assessment. As Stoll, Fink and Earl (2003) state, "Believing you can be successful is critical to internal capacity [for learning]" (p.162).

In summary, the research shows that presenting the curriculum in smaller 'pockets of learning' can enhance student motivation to learn but does require that teachers be able to:

- Be thoroughly knowledgeable of their subject so that they can both compartmentalise the subject into achievement and unit standards to make it accessible to students and still make it appear 'whole' to the students.
- Know how to support and motivate students to set realistic goals

The third advantageous feature of NCEA lies in the achievement criteria which are clear and explicit for every unit and achievement standard in a manner that was not at all present in School Certificate therefore students may find that achievement in NCEA is more attainable because they know precisely what is required to meet a Unit or Achievement Standard. For enhanced student achievement to be maximised however, certain conditions need to be in place.

Firstly it makes sense that if students are to know precisely what is required to achieve in an NCEA Achievement or Unit Standard, they would begin with a desire to achieve, a personal goal orientation. Student desire for achievement is described as motivation and recent research into motivation has been conducted by Meyer et al (2006) in their paper 'The Impact of NCEA on Student Motivation'. They found that students who set goals and made a personal commitment to doing their best towards meeting those goals in NCEA were likely to achieve them and were likely to set higher achievement goals such as achieving Merit or Excellence in Achievement Standards. Conversely students who aimed to do just enough to get through, were more likely to be doing Unit Standards, and were not particularly motivated to doing their best in a system that to them seemed largely irrelevant. In fact their research found that the less motivated students performed poorly in terms of the number of credits they obtained and the future choices they made about further education. Therefore we can see that student motivation is a crucial factor in the success of student achievement.

If students are to have a strong desire to do their best towards meeting the achievement goal it seems important that a student knows what the criteria are for achieving the goal. NCEA criteria for each achievement and unit standard are published on the NCEA website and are accessible to all. While it seems essential for the teacher to have clarity over the standards of achievement required and the ability to break each subject down into small chunks of learning, it also seems essential that the motivated student has clarity over the

standards to be working towards as well. After all it is the student's own personal learning and achievement that is the centre of the discussion here.

Secondly, if students are to achieve their goals, they will require repeated focussed and dedicated attempts at working towards them. Black and William (2006) noted that teachers were able to design 'didactic situations' or generate questions and tasks which created 'teachable moments' and which encouraged dialogue. They are focusing on what the teachers did to enhance student achievement. Yet the didactic situations are requiring the student to take an interactive role in the dialogue and therefore the student needs to be clear about the criteria that they are working towards, reflective about their progress to date and eager for support from their teacher or a fellow student if they are to gain a deeper understanding and benefit from the didactic process. The interactive role in the learning process is strongly argued by Bishop and Glynn (1999), Timperley (2001) and Wagner (1994) that effective interaction enhances the student's capacity to learn.

The third point implied by the use of transparent criteria for the achievement and unit standards is that the criteria enable the students to self assess. Self assessment is a very important strategy in effective learning as it builds self esteem and encourages students to take a greater role in the learning process. Black and William (1998) state the importance of self assessment clearly: "self assessment by pupils is in fact an essential component of formative assessment. When anyone is trying to learn, feedback about the effort has three elements: recognition of the desired goal, evidence about present position and some understanding of a way to close the gap between the two. All three must be understood to some degree by anyone before he or she can take action to improve learning (1998, p. 6)". It seems reasonable that if students are to progress towards meeting their goal, that they have a clear idea of how far away that goal is, for themselves.

This means that as teachers manage their NCEA classrooms they make a priority of establishing a conversational learning climate where students have clarity over their criteria and routinely assess their efforts towards meeting these criteria in order to know what they need to work on next. Alton- Lee in her Best Evidence Synthesis (MOE, 2003b) supports this by acknowledging that effective teachers actively engage their students in their own learning and assessment. Timperley, (2001) describes the value of conversation in classrooms as greatly enhancing the capacity to learn when the conversations are about how to learn.

The capacity of NCEA to enhance the potential for student achievement is evident through the transparent criteria available for each Achievement and Unit Standard. Black (1997) and Sadler (1998) both describe the potential for self assessment to motivate and improve student learning. However for enhanced student achievement to be truly realisable it is dependent on certain conditions such as a climate of trust in the classroom, students motivated by a desire to do their best, students self assessing and sufficiently motivated and articulate in contributing through conversation towards their deeper understanding and their own next learning step. Conversations about learning can change learners understandings and move them towards achieving their goals (Wagner, 1994).

Hill and Hawk (2000) describe the crucial importance of good relationships between teachers and students and between students with if the secondary classrooms are to be effective learning environments. Absolum (2006) states, "The teacher must know how to manage the motivational climate of the classroom, and how to foster and build a learning focused relationship with students so that students have optimal opportunity to build their own motivation to learn (2006, p.22)".

In summary, to maximise the opportunities for student achievement that clear standards and criteria present, teachers will need to:

- leverage the clear standards and criteria of NCEA to motivate students to set their own clear goals and make personal commitments to wards those goals
- teach and support students to self assess
- provide students with repeated opportunities to meet the criteria
- manage the motivational climate of the classroom and assist students to build their own motivation to learn.

The final and fourth feature of NCEA which may have pedagogical implications for teachers, is the fact that internal assessment is an important component of NCEA. Internal assessment enables students to have repeated opportunities to achieve, which, by rights, ought to increase the opportunities for students to achieve and thereby increase their success. This however, supposes that teachers enable students to have those repeated opportunities to attempt the internal assessments and thereby achieve and also that students apply effort and make an improvement in the subsequent assessment opportunity. This may therefore be a significant implication for teachers if they have a tightly scheduled course of study and also if students are unwilling to put in the effort to improve.

What is new with NCEA is that the internal assessment and external assessment will be given equal weight, so all three levels of this national qualification have a significant component of the learning assessed internally. For internal assessment to be valid and reliable, teachers will require a deep curricular knowledge about the standards for each unit. The Ministry of Education was aware of the importance of reliable and consistent internal assessment and has supplied professional development to all secondary schools through the implementation phase of NCEA, (2001-2004) assisting teachers to write assessment tasks and to moderate them effectively (Starkey et al, 2006).

What has been noted by Starkey et al, 2006, is the need for ongoing professional support to schools. For the reliability and consistency of internal assessment to be assured, regular moderation processes between schools may be required. That teachers of NCEA classes are aware of this seems as important a factor as the teacher's accurate knowledge of the curriculum to make effective professional judgements for internal assessment. The 2006 Report on Consistency Review of Achievement Standards published by the Ministry of Education made ten recommendations which were forwarded to the Joint Officials Group of senior management from Ministry of Education and NZQA, and also to the Secondary Principals and Leaders Forum. Of these, nine were about changes that could be made to the nature of the assessment combinations, one being that Achievement Standards could be developed in the future to be both internally and externally assessed, the decision resting with the school. Another pertinent recommendation was around pedagogy to support NCEA. "That a range of strategies to refocus attention on teaching and learning rather than on assessment driven learning be implemented. NCEA cross level consistency review" (MOE, 2006, p.6). So the Ministry of Education has now stated publicly that pedagogy is important for NCEA.

However, another very real issue with internal assessment in NCEA is the fact that it will give students more than one opportunity to achieve their best performance in an internal qualification. A student who might have received 'not achieved' grade might have sufficient opportunity to gain an 'achieved' grade, just as a student who might have achieved with merit could strive to achieve with excellence in a new task assessed by the same Achievement Standard later in the year. What this supposes, however, is that the student who might have received the 'not achieved' grade, is motivated and committed to their further learning and that each subsequent attempt is an improvement on the previous one. NZQA in their 2006 survey of students and teachers views on NCEA found that overall,

70% of candidates preferred internal assessment to external assessment because they found it less stressful, they had more time to prepare, the subject was fresh in their minds when the assessments were taken and they had the opportunity to re-sit the assessment if they didn't pass the first time (NZQA, 2006). Therefore this 70% figure can suggest that internal assessment is a really important component of NCEA and that teachers and students need to work together to make the most of it.

In conclusion, when I examine all four aspects of NCEA that can have an impact on the way teachers work and students learn and therefore have the potential for increasing student achievement, I observe that central to each aspect is the motivational role of students and their capacity to be active learners cognisant of their learning needs and their progress towards their goals. For this to happen certain factors need to be in place. This literature review will now examine the literature around assessment for learning, the pedagogy that may enhance students' potential for achievement with NCEA.

### **Pedagogy which may enhance students' potential for achievement with NCEA**

In the previous section we have argued that there are four features of NCEA that distinguish it from the previous qualification arrangements and that make it supportive of enhanced student motivation to learn and to achieve. These are:

- improved choice of what to study, through alignment of vocational and academic to accord the vocational more status, through better chunking of units of study to allow students greater choice selection
- smaller 'chunks' of learning that make it easier for students to learn and achieve
- improved clarity about what is to be learnt,
- improved opportunities to succeed through reassessment of units not initially learnt to the desired standard

However, these features will not be apparent to students unless the students engage with the system in some way. Disengaged students will not benefit from enhanced choice, from more defined learning goals, from improved clarity of those goals or from reassessment opportunities. How well students engage with the qualification system is dependent on how well they engage with their learning.

There is an extensive literature about the characteristics of an engaged learner. Descriptions used to describe the engaged learner are those such as: self-efficacious, self regulating, actively involved, producers of knowledge, reflective, inquiring and interactive (Bandura, 1986, Dweck, 1986, Zimmerman, 2001). Bandura painted a portrait of human behaviour and motivation in which the beliefs that people have about themselves are key elements in the control of personal agency (Bandura, 1986). Dweck considered that students can be thought of as engaged learners when they are able to: conduct authentic and multi-disciplinary tasks; students participate in interactive learning; work collaboratively and learn through exploration. Students with these qualities ought to be able to take advantage of the four features of NCEA as follows.

- The engaged learners will value being able to choose and create their own course of study to match their own interests, Harlen (2006) notes that students who have personal interest in subjects persist with them for longer. Self efficacious students should have their motivation to succeed heightened by an assessment and qualification structure that allows them to follow subjects that they have a personal interest in.
- Engaged learners will value having a curriculum/qualification system that is explicit and clear about what a student needs to know and do to meet each achievement or unit standard by itself. The importance of small explicit 'pockets of learning' lies in the goals that students can set that will be of use in guiding them towards meeting the criteria. As Harlen (2006) suggests, the particular goal that is adopted is critical, it needs to be understood, appear achievable and be seen as worthwhile. The students who value academic goals will likely be motivated to achieve them. Therefore the smaller units of learning made available by the Achievement and Unit Standards will enhance the potential for achievement providing that the student is clear about what their goals are and are motivated towards achieving them.

The compartmentalised nature of the units in each curriculum area are ideal for greater student involvement in the assessment and learning process, as Hill and Hawk (2000) found, "Taking small steps helped...to gain their participation and motivate them" (p.8). It makes sense to the engaged learner who can see the 'end point of the unit of learning', who can talk about, describe and work with the learning context and build a sense of dynamic involvement in a defined unit of learning. The dynamic character of the student/ teacher relationship could enhance opportunities for discussion and

student generated questioning. The value of these types of interactions are found in the literature of Bishop, Berryman, Tiakiwai and Richardson (2003), Black and Wiliam (1998), Crooks (1988) and the MOE (2003).

- Engaged learners will succeed with NCEA because the criteria in each Achievement and Unit Standard will enable them to have a shared clarity about what requires learning and this clarity will lead to further engagement. Examples of the specific qualities required to meet the criteria are able to be shared with students. If students are engaged they will use the examples of the qualities required, to assist their reflection on their own achievement and adjust their approach in order to attain success. As Alton-Lee (MOE, 2003) has recognised, independent, autonomous learner strategies such as self assessment, a sense of inquiry, collaborative intent, active reflection, and readjustment of goals, are all skills that good learners use and which NCEA students would find helpful.
- Engaged learners who have a strong sense of their capacity to learn and improve will value the reassessment opportunities available through the internal assessments of NCEA. Such improvement would require a student to be motivated and in control of their own learning, which has been described by Bishop and Glynn (1999) as effective when learning takes place actively and reflectively. As Black and William (1998) have also observed, pupils learn from shared discussions with teachers and peers, therefore a classroom which encourages active learning, active reflection and lots of learning focused conversation could be one in which great learning is taking place. As Meyer et al (2006) concluded, motivation was also strongly influenced by perseverance, and a student would need to be strongly persevering if they were to make improvements to their understanding so as to re-sit an internal assessment.

This means that in order for NCEA to have a positive, self-reinforcing, impact on student achievement, teaching approaches need to support and build students as engaged interactive learners. Therefore what does the literature say about the pedagogical approach that is likely to support learning of this type?

In Adrienne Alton-Lee's analysis of the research on effective teaching she notes that "pedagogy that promotes learning orientations, student self regulation, metacognitive strategies and thoughtful student discourse" (p.79) leads to enhanced student

achievement (MOE, 2003). This concept of learning orientations is supported by the U.K research of Black and William (2006) who describe 'learning how to learn' as being achieved when students (or any learner) can make sense of where they are in their learning, decide where they need to go and how best to get there. To encourage students to work in this way, Stoll, Fink and Earl (2003) suggest that the process of learning needs to be a central part of the lesson, that teachers can enhance student learning by teaching students how to learn.

Self-regulation is a crucial strategy used by engaged learners. It refers to learners consciously controlling their attention and actions so that they are able to solve problems that will enhance their learning (Harlen, 2006). While it is reasonable for teachers to view students as either self-regulating or not, the recent motivational research by Meyer et al (2006) observed that "these student dispositions are themselves amenable to change and can be influenced by what teachers do" (p.5). Therefore the capacity to develop self regulating engaged students is available to teachers in NCEA classrooms, if they follow the findings of the literature. Alton-Lee in her 2003 research, states "sustained higher achievement ... occurs when teachers use pedagogical approaches that effectively support students in taking charge of their own learning" (MOE, 2003, p.79). Such approaches include the use of what Brophy (2001) terms promoting a learning orientation whereby activities are introduced with an emphasis on what students will learn from them, mistakes are viewed as a natural part of the learning process and students are encouraged to collaborate and help each other. The self-monitoring strategies of students are likely to be enhanced when students become engaged in learning and supported by a learning focused classroom climate suggested by Brophy's (2001) findings.

Engaged interactive learners as described by Stoll, Fink and Earl (2003) are inquiring and reflective and they observe that "the most salient and exciting product ... happens when pupils monitor their own learning and make adjustments by deciding what worked and what needs revisiting" (p.69, 70). The capacity to think about the learning process, assimilate it, relate it to other experiences and change or adapt it is an important reflective skill supporting effective learning and improvement (OECD, 2005). The literature around meta-cognition suggests that engaged learners reflect on their progress, select and use strategies for learning, and evaluate their own success. As Donovan, Bransford and Pelligrino (1990) reflect on the importance of metacognitive skills they state: "A metacognitive approach to instruction can help students learn to take control of their own

learning by defining learning goals and monitoring their progress towards achieving them” (p.13).

The instructive approach Donovan et al (1990) suggest requires teachers to encourage students to reflect or even perhaps ‘think aloud’ about their learning process and the evidence of and reasons for their success or lack of success, so as to collaboratively construct the next step forward towards their next goal. The significance of this strategy is extolled by Alton-Lee (MOE, 2003) when she describes that the metacognitive approach has been found to empower self-regulating students and have the largest impact on student achievement of any teaching practice. Therefore it would be reasonable to suggest that NCEA teachers would make a significant contribution to student achievement if they made student metacognition a feature of their classroom instructional processes.

Effective learners test out their ideas and strengthen and expand them through student discourse. Black and Wiliam (1998, p.8) describe this as “teaching through interaction”, although this point also supports the converse of learning through interaction. Black and Wiliam observe that collaborative discourse can lead to self reflection and significant gains in learning. Therefore the more opportunities there are for conversation the better, (Gipps, McCallum & Hargreaves, (2000); Bishop, Berryman, Tiakiwai and Richardson (2003), Black and Wiliam (1998), Crooks (1988) and the MOE (2003)). Bruner (1996), Bishop and Glynn (1999) and Dweck (1986) also recognise the role that the student needs to play in the learning process – that is to be a co-collaborator in the discourse, active and reflective. So it is reasonable to suggest that the engaged NCEA learner would be interacting with other students or their teacher in the pursuit of clarity or expansion of the ideas currently under development during the lesson. Brophy (2001) actually suggests that it’s the way that the teacher operates with the students that encourages this conversation, “Students are taught to ask questions ..., contribute to lessons ..., and to collaborate in pairs or small groups on many of their learning activities” (p7). Hattie (1999) reported meta-analyses that show that teacher questioning can have a positive effect on student achievement if it promotes thoughtful and sustained student discourse, especially if it supports and generates higher order thinking.

Alton-Lee (MOE, 2003) concludes “effective teachers actively involve students in their own learning and assessment, by making learning outcomes transparent to students, offering specific, constructive feedback, and ensuring that assessment practices impact positively on student motivation” (p.92). The stress on ‘effective teachers’ is constant in the literature

around student engagement, and yet this argument is about the students' NCEA learning. So by turning the concept around, we can suggest that effective learners actively engage in their own assessment, are clear about what they are learning, and seek constructive feedback which they use to refine their understanding and their learning,

The pedagogical approaches suggested by this research could be described as being characterised in an NCEA classroom by:

1. A strong sense of partnership between the student and the teacher, where the student is motivated to learn and engaged in interactive learning, and the teacher actively acknowledges and encourages this.
2. NCEA Achievement or Unit criteria are the focus of the assessment – so that the teacher assists the student to have clarity about what the criteria for the unit or achievement standards are and how they are progressing towards these
3. The teacher is being explicit in negotiating a shared clarity for both the student and themselves about what the student needs to learn
4. The teacher expecting and encouraging student self assessment against specific criteria for the aspects students are trying to learn
5. The teacher encouraging student initiation, where there is a gap in their understanding, students initiating conversations (with students or teacher) that explore and strengthen that understanding and minimise the gap - towards the student constructing their own meaning
6. The teacher encouraging routine reflective dialogues (with students or teacher) about the effectiveness of the learning process as a routine strategy in the management of the classroom learning environment

For students to meet the requirements of their future they need to be active learners with a strong sense of self efficacy enabling them to become learners finding success in every facet of life. This table summarise these findings from the literature.

**Table 1 Roles of teachers and students in relation to NCEA**

<b>Aspect of NCEA</b>	<b>Role of school/ teacher</b>	<b>Role of student</b>
The combination of academic and vocational courses of study	Schools to work with students to assist them find an NCEA course to meet their qualification needs	Students need to know what they require the qualification to do for them and need to have ambitions that school can help them achieve
The 'pockets of learning in both unit and achievement standards	Assist students to see that they can achieve these.	Be focused on achievement, know the criteria, and work with their teacher and students to see that they can achieve. Keep up to date, be active in the learning
Achievement criteria for every standard	Use exemplars to demonstrate for students the quality required to meet the criteria. Involve students in recognising this standard. Assist students to self assess against the criteria and to reflect on their further learning needs.	Know the criteria for every standard in their qualification. Use exemplars to gain clarity of the quality of the criteria. Regularly self assess against the criteria and reflect on the further learning needed to meet the Achievement Standard.
Criteria for different standards of achievement: Not Achieved, Achieved, Merit, Excellence	Use exemplars to demonstrate the different qualities required for the different criteria. Assist students to set goals for achievement and improvement. Encourage student self assessment against the criteria to recognise their learning needs.	By using the exemplars to gain clarity over the qualities required to meet the difference standards of criteria, students need to be able to set goals for both achievement and improvement Self assessment will enable them to recognise their learning needs and their progress towards their criteria.
Individual mix of unit and achievement standards and internal and external assessment	As the NCEA offers the potential to personalise the course design, teachers need to work with students to assist them to develop the course that will be most useful for both their learning and their qualification needs. To do this teacher / student relationships need to be based on respect, openness and honesty	Students need to desire to achieve their NCEA and to work collaboratively with their teacher to design a course that will meet their learning and qualification needs. Contribute openly, honestly and respectfully with their teacher to design a course that will best meet their personal purposes for the qualification.
Internal assessment is an important component of NCEA	Inspiring students to work towards the internal assessment. Encourage students to make repeated improved attempts to meet the criteria.	Students being independent, active and motivated learners, with a strong desire to achieve NCEA and to make use of the opportunity for repeated improved attempts with internal assessment.

## Implications for Professional Development in NCEA

During the implementation of NCEA the New Zealand Ministry of Education provided support for the teachers with funding for professional development. In their Review of Secondary Schools' Use of NCEA professional development resources 2005-2006, Starkey, Stevens, Taylor, Toia, Yates, Hall, McKenzie and Meyer found that most schools used the Ministry's professional development funding to focus on the technical aspects of NCEA assessment. They described the technical aspects as including "writing assessment tasks, interpreting standards and the criteria for Achieved, Merit and Excellence, marking student work, using or developing exemplars, understanding resubmission standards and the mix of Unit and Achievement Standards in NCEA programmes" (Starkey et al, 2006, p.3). While all of this is important with a new assessment and qualification system, none of it specifically supports the pedagogy necessary to support greater student achievement through the standards-based nature of NCEA. In order to take advantage of the potential for NCEA to motivate students who would have failed in their previous norm-referenced system it is timely to consider other forms of professional development and to examine how to enable students to enhance their learning and their achievement.

Effective promotion of assessment for learning in secondary school classrooms could require radical transformation of both teaching and learning roles according to James and Peddar (2006). This point is supported by Coburn (2003) who notes that to be effective any school-based innovation (professional development) about schooling improvement must look beyond the surface data to the pedagogical principles embodied in the way teachers engage students in their learning.

The groundwork has already taken place for the collaborative notion of secondary teachers' professional development as Starkey et al (2006) have described. Of the 24 secondary schools Starkey's team surveyed, the teachers consistently voiced a desire for further professional development. If teachers are to change their practice and learn from the wisdom of research findings they will need to be active participants like their students. As Absolum (2006) states, "to learn to be active, we have to be active. To learn from other's wisdom we have to practice interpreting this wisdom in terms of our own understandings" (p.12). Active learning in professional development has been shown by Hill, Hawk and Taylor (2002) to require teachers to observe, network with peers, share best practice, monitor, review, evaluate outcomes and keep up to date with professional

reading (Hill, Hawk & Taylor, 2002). So the active collaborative desire for growth and development is an essential ingredient in the effectiveness of any professional development.

The need for long term change processes have been signalled by Starkey et al's 2006 findings which support the findings of Van Driel, Beijard and Verloop's (2001) results. They found that if change in teachers' practical knowledge was to be lasting, then the professional development needed to be long term. This supports Cardno's observation that professional development needs to be actively managed through strategic planning (2005). So professional development initiatives to strengthen student learning and achievement through NCEA need to be longitudinally planned over many years if they are going to bring about enduring success.

And finally, if professional development is to be of any value it must produce valued change, in that if professional development is to increase the involvement of students in their assessment and learning through the application of assessment for learning practices, then it also needs to improve the learning and the achievement of the students. James and Peddar (2006) found that the learning that teachers went through when altering their practice was mirrored by changes for students as well and that the classroom was the basis and the environment for effective learning. Thomas Gusky, writing in his paper on Redesigning Professional Development (2002), suggests that national, regional, and local education budgets are too tight to allow professional development to occur without the need for some assurance that it will be effective and make a difference.

In New Zealand secondary schools, professional development to raise student achievement in NCEA could be measured either by tracking the increase in the number of credits students accrue, or by tracking the improvement in the proportion of excellences and merits with each credit accrued. As has already been noted in this literature review, the shift to NCEA has not yet enabled more students to gain a secondary school qualification. There is a common thread from Coburn (2003), Gusky (2002), James and Peddar (2006) and Senge (2000), that any professional development initiative needs to focus on the value to be added and be able to demonstrate that the value has been added and sustained.

## Summary

The literature suggests that while NCEA teachers have already received considerable professional development around the new assessments on this qualification, this professional development has primarily been to assist them to understand the technical aspects of the standards-based assessments. Little has been done to address the pedagogical issues and Starkey et al's (2006) research found that the secondary teachers in their 24 schools were now ready to develop classroom based strategies for responding to the standards-based nature of NCEA in terms of embracing the ideas around assessment for learning. It can be seen from the literature cited that professional development needs to be based on researched findings and translated into classroom contexts by the teacher. Professional development also needs to be grounded in a desire to improve students' success with NCEA.

## **Change Management Literature**

In the previous section we identified the need for effective professional development to assist secondary teachers to maximise the learning and achievement potential for students in NCEA. James and Pedder (2006) have cautioned over the challenge ahead for teachers to respond to the ultimate goal of promoting learning autonomy in the NCEA students. For professional development to be successful it requires strong leadership at every level of education (Coburn, 2003, Fullan, 2003).

The literature around change management suggests that a strong vision of the change desired, and a strategic plan for how to proceed with the change are essential if the change is to be enduring. Fullan, (2003), suggests that any change process should be underpinned by a moral purpose. The morality of equality of educational opportunity for all is a strong tenet of our state education system, as is the idea of promoting lifelong learning (MOE, 2004). Powerful, motivated, self-regulating learners will embrace the faster pace of change in the future and maximize their own opportunities for success.

Hipkins, Connor and Neal (2005) in their recent research into the changes teachers have made with teaching NCEA have observed that if further change is going to take place in teachers' classroom practice, then adequate timeframes are needed for real shifts to happen in school systems. As with the findings of Starkey et al (2006) recent research is demonstrating that time is needed for teachers to embrace pedagogical strategies to grow more independent and self regulating NCEA students. Hipkins, Connor and Neal (2005)

mention three to five year time frames for secondary schools.

Strong leadership draws on the importance of having a strategic vision to manage effective change. Cardno (2005) and Coburn (2003) recognise the importance of a strategic approach to making lasting change, in addition to making the reform ideas go deep and influence decision making at all levels in the school. This concept is supported by the view of Stiggins (2002) who recognises that reorienting education to address sustainable development requires reform at every level of education, from policy level right through to practitioner (classroom) level.

In terms of building a commitment to self-regulated learning in NCEA classrooms through the professional development of secondary teachers in the use of assessment for learning, this could be played out through Ministry of Education strategic planning, at policy and subsequent funding level; it could be fulfilled through principals of secondary schools involving their staff and boards in strategic planning and in making an internal commitment to growing self-regulating learners; it could be linked to teachers' personal goals and professional development aligned within their job descriptions.

A common theme in change management literature is the importance of leadership and organisational members all having the same vision and working together in a collaborative sense towards a shared goal, (Bolman & Deal, 2004; Cardno, 1998; Fullan, 2003; Moss-Kanter 1983). Moss-Kanter (1983) notes that excitement can be motivational when all levels of an organisation are involved in the change. In New Zealand terms this could be related to all members of a secondary school being involved in the changed classroom practices to enjoy the benefits of NCEA. Fullan (2003) recognises that it is up to teachers and schools to take responsibility and sustain the changes in practice in ways that make a difference to the students. Effective change requires buy-in of the individuals in an organisation and this can be established through discussion about the innovation so that gradually all members gain a common understanding of the purpose and direction of the vision. The meaning of the vision, change direction or innovation, is constructed over time through a social process of human interaction. This is in alignment with aspects of assessment for learning theory, that learners need to make their own meaning of a concept which often can occur through discussion and clarification of their construct with someone else, either peer or teacher.

Scott (2000) in his conference paper to NSW principals suggested three themes for

managing educational change: change is learning; there is a difference between change and progress; and that individual and organisational learning are inextricably linked. It is the third point which draws alignment with the themes in this dissertation, for if the organisation, namely the school, is to make change in order to promote the value of autonomous learning, then the individuals within the school, like the teachers and the students and the teacher support staff and the parents also need to value and promote self-regulated learning.

Finally, the significance of resourcing for change is recognised by Cardno (2005), Coburn (2003) and Stiggins (2002). Gusky (2002) challenges with the generalisation that national, regional and school education budgets are too tight to allow professional development to occur without some assurance that it will be effective and make a difference. Stiggins (2002) however, makes a much stronger challenge. He contests that if schools are to make changes based on improvements in classroom practice then these need to be supported financially. He suggests: “match every dollar invested in [summative qualification systems, like NCEA] with another dollar invested in the development of assessment for learning” (p.765).

It all really comes back to the vision, the idea of self regulating learners being the purpose for the shift to standards-based assessment in NCEA. How clearly is this desired, how strongly is this owned by the New Zealand secondary education sector? And how committed to student learning and corresponding student achievement are schools? For only if the desire for improvement is strong can enduring change be planned strategically, funded fully and embedded in our education system so that we develop students who are lifelong learners and able to make their way successfully in the world.

## **Chapter 2 Summary**

This chapter on the research literature has demonstrated a common recognition both in New Zealand and internationally of the importance of student involvement in the learning process. Of critical importance at this time in New Zealand is the changed secondary school assessment and qualification system NCEA, and the Government’s desire for students to achieve well within it. In order for students to do this, they and their teachers need to recognise that the standards-based assessments of NCEA allow and support self-regulated learning and that students need to have a much greater role to play in the

process than previously.

The historical background section attempted to show that NCEA evolved out of a culture of dissatisfaction from the schools and industry with the previous norm-referenced system of School Certificate and Bursary. The NCEA was developed in response to requests for a qualification that could embrace academic and industrial training and still respond with rigour to the tertiary training requirements without failing so many students.

The NCEA is made up of Achievement and Unit Standards and these all have specific criteria used for assessment. The Achievement and Unit standards are standards-based assessments and the requirement for each is available to teachers and students online through the NZQA website. Because assessment in NCEA is standards-based it means that students can have greater contribution in their learning programme through the choice of what to study for NCEA and also through actual engagement in the learning process, providing that the teacher works with them in a certain way.

The research of Adrienne Alton-Lee (MOE, 2003) has defined a wide variety of strategies that teachers can use to enhance student learning and raise student achievement. Alton-Lee's research is supported by the findings of Black & William (2006), and many others and they all recognise that it is the teacher and the teacher's actions which make the difference to student engagement and achievement.

The Ministry of Education has supported the implementation phase of NCEA with professional development opportunities for teachers in secondary schools around New Zealand. While professional development activities varied, Hipkins, Connor & Neill (2006) found that the major focus across schools was on achieving or enhancing assessment skills for NCEA. The focus to date has been on the technical issues, around moderating, writing assessments, and not at all about pedagogy, and the manner in which teachers can work with their students. This literature review has looked at the need for further professional development pedagogy. It can be seen from the research literature cited that professional development needs to be based on researched findings and translated into classroom contexts by the teacher. Professional development also needs to be grounded in a desire to improve students' success with NCEA.

If schools are to engage in further professional development around pedagogy which will raise student achievement in NCEA, then there will be some wise strategies to be mindful

of from the change management literature. If change is to be enduring then it needs to be based on a moral imperative (Fullan, 2003) and it needs to be understood and valued at all levels of the school system, from the Board of Trustees right down to the teachers and students, and developed strategically so that it can be resourced well (Cardno, 2005; Gusky, 2002). Finally, if it is to make an improvement to student achievement then it will need to foster and promote life-long learning.

Each of these literature bases, the literature on effective pedagogy, on NCEA, on professional development and on change management in education, makes clear the imperative to raise achievement of students through effective pedagogy. Therefore from the pedagogical literature review there are aspects of teacher practice and student participation that will make that difference to the achievement of the students. The aspects of teacher class room practice that could be expected to be present if the teacher understood and practised the strategies described in the pedagogical research literature could look like the following:

1. A strong sense of partnership between the students and the teacher, where the students have been give a choice about what Units to study and are motivated to learn and engaged in their learning
2. The teacher focuses on the NCEA achievement or unit standard and assists the student with understanding of the criteria and how they are progressing towards these
3. The teacher negotiates with the students about what needs to be learnt so that there is a shared clarity for both the student and the teacher about what the student needs to learn
4. The teacher encourages and supports students to self assess against specific criteria for the aspects students are trying to learn
5. Where there is a gap in student understanding, the teacher encourages students to initiate conversations (with students or teacher) that explore and strengthen that understanding and minimise the gap - toward the student constructing their own meaning
6. the teacher encourages reflective dialogues (with students or teacher) about the effectiveness of the learning process as a routine part of the lesson

If the previous qualities of teaching practice were present then these aspects of student participation could also be expected to be present:

1. A strong sense of partnership between the student and the teacher, where the

- students are motivated to learn and are engaged in their learning and have been given a choice about what to learn
2. Assessment –students have clarity about what the criteria for the unit or achievement standards are and how they are progressing towards these
  3. Students have the same clarity as the teacher about what they need to learn and why and this has been negotiated with the teacher
  4. Students self assess against specific criteria for the aspects they are trying to learn
  5. Where there is a gap in their understanding, students initiate conversations (with students or teacher) that explore and strengthen that understanding and minimise the gap - toward the student constructing their own meaning
  6. Reflective dialogues (with students or teacher) about the effectiveness of the learning process are initiated by the students as a routine strategy.

This now provides a framework for this research project. Firstly to examine the state of an NCEA classroom to see what of the researched pedagogy is actually in use. Secondly to reflect on this literature base to find some implications for successful professional development and thirdly to recognise the change management processes from the literature that could ensure the effectiveness of the changed professional practice being sustained. The Ministry of Education (2004) “Together we must raise expectations of achievement for all students....We must focus on effective teaching as the key ingredient for success” (p.4), clearly states the aim of raising student achievement through effective teaching and this research project is aiming to clarify how to do that with NCEA.

The following chapter will examine the methodology and describe the research methods used in this project. A diagram of the research design is available on page 59

# CHAPTER THREE

## **CHAPTER THREE**

### ***Methodology and Research Methods***

#### **Introduction**

This study is small scale research used to explore and describe the motivation, the intentions, the understanding and the actions of students and a teacher within one NCEA class. The purpose of this chapter is to select a suitable research methodology most appropriate to addressing the research question, do teachers and students in NCEA classrooms actually do what the research says they should if the potential of NCEA is to be realized? The first section of this chapter examines the nature and role of research, makes links to the purposes of research and discusses which methodology is most appropriate for the research question. The second section describes the methods used for data gathering and data analysis, considers validity and reliability and addresses ethical issues.

#### **The Nature and Role of Research**

Research is an active, diligent and systematic process of inquiry aimed at discovering, interpreting and revising facts in order to produce an even greater understanding of events, behaviours, or theories, and make practical applications through laws and theories. Pring (2000) states, "The term research is used to refer to any systematic critical enquiry which aims to contribute to the advancement of knowledge (p.7)". Three approaches to research have been defined: the systematic, controlled investigation of hypothetical propositions; the validation process, where subjective belief is checked against objective reality; and the self-corrective function, which ensures the ongoing revision of 'truth' (Cohen, Manion & Morrison, 2003). The particular value of scientific research in education lies in its capacity to enable educators to develop a sound knowledge base like other professions and to ensure education gains a sense of maturity and a sense of progression it at present lacks (Cohen, Manion & Morrison, 2003).

Research methodology has evolved from the historically predominant quantitative approach to include a range of qualitative approaches. Quantitative research originated within the pure sciences and a philosophy known as logical positivism and it focused on observable and verifiable facts. The qualitative approach developed in response to

criticisms of the positivist paradigm and includes notions such as, observation cannot be purely objective and entirely independent of the values of the observer, that observation of human behaviour alone, which is such an important focus of some research, provides little information about intentions or feelings.

The post-positivist paradigm grew to respect values and perspectives as legitimate in the search for knowledge, to observe the connections, causes and correlations, to catch the dynamic nature of events and to seek large patterns and trends over time. Interpretive research is the methodology which grew out of the post-positivist paradigm, through a desire to understand the research situation from the individual's perspective of their own reality.

While quantitative research may rely on the numerical data generated to illustrate a situation, qualitative research is more closely aligned to applied or action research (Anderson & Arsenault, 1998). Qualitative research is considered vital for debate and fundamental to ongoing inquiry and scientific knowledge building because "judgement is used and therefore interpretation is open to debate. The facts never speak for themselves" (Eisner, 1998, p.33). The intention of qualitative research is to disclose the implicit meaning in a particular situation from one or more perspectives.

The role of research in education is to find ways to improve education. However, Hargreaves (1999) contests that teaching is not a research based profession. Others also, claim that research has not traditionally had a significant impact on teachers' practice (Cohen, Manion & Morrison, 2003). One reason for the research in education not being used well may arise around issues of access to research for those who can benefit from it. (Hargreaves, 1999; Pring, 2000; Wellington, 2000).

The role of research is to improve the structure of education and its capacity to respond to the changes in society. In order to find dependable solutions to problems, practitioners and educational policy makers must source and apply effective research (Cohen, Manion & Morrison, 2003; Pring, 2000; Razik & Swanson, 2001).

The purpose of this research study is to describe what teachers and students in an NCEA classroom do and whether this is what the research says they should if the potential of NCEA is to be realized. In order to improve the achievement of students in NCEA this research may serve to generate further research or it may in turn influence policy change to make support for learning a priority of NCEA professional development. To realise this

aim of advancing theory and improving practice, research methodology and methods must take account of the complexities and the humanistic nature of the educational setting, therefore a qualitative methodology would be appropriate for this research study.

## **Methodology in an Educational Context**

Research in education is a disciplined attempt to “address questions or solve problems through the collection and analysis of primary data for the purpose of description, explanation, generalisation and prediction” (Anderson & Arsenault, 1998, p.6). While an ultimate purpose of knowledge derivation through research is to provide a basis for action (Husen, 1997), researchers have become increasingly aware that education does not take place in a social vacuum. Neither are educational practices immune to the cultural and social context in which they operate. Therefore an interpretive spirit of inquiry is required if a researcher is to make sense of a given educational situation.

Interpretive research begins with individuals and sets out to understand their interpretations of the world around them; theory is emergent and must arise from particular situations, it should be grounded on data generated by the research act. Theory should not precede research but follow it (Cohen, Manion & Morrison, 2003). Research involving the socio-cultural context is well suited to a case study design, particularly in educational research because the case study focuses on the unique interpretation of events shaped by the participants in the situation.

The socio-cultural context refers to the educational characteristics of the student population as well as to the engagement levels of the students and the teacher who participate in the lesson. Research such as this study which is looking at the motivation and interactions of students and their teacher in the NCEA classroom will describe the distinct ways these people experience and understand their role in the learning process.

Anderson and Arsenault (1998) have observed that the process of descriptive research must begin with objective measurement and observation. Without this the researcher is unable to provide meaning for others and the research will be of no general use. Descriptive research examines the big questions ‘what is happening? or what happened in the past?’ Descriptive research has two major branches, historical and contemporary. This descriptive case study research project will be examining a contemporary situation.

Qualitative research, incorporating a case study approach, explores phenomena in their natural settings and uses a range of methods to interpret, understand, explain and bring meaning to them (Anderson & Arsenault, 1998). A qualitative case study can provide a profound understanding of the world through conversation and observation in natural settings rather than through the artificial conditions of clinical experiments. It is based on a phenomenological perspective where people's actions create the social world, and is less concerned with facts and more with understanding the nature of human activity. This case study fits in with Eisner's (1998) qualities of a qualitative inquiry because it "studies information in situ", the researcher knows what to collect and what is relevant, it is interpretive in character because it is trying to account for what is happening and why, and provides a description (p.33).

This study supports a case study approach, encourages reflection, enables the capturing of individual perspectives, acknowledges the constraints of everyday life and values rich detailed descriptions, all elements highlighted in Denzin and Lincoln's (2000) definition of qualitative research. Within the parameters of the qualitative research methodology used in this study there is a range of appropriate methods for data gathering and data analysis that support a case study approach. Case studies have been found by Anderson and Arsenault (1998), to be a useful way of looking at specific cases systematically, collecting data, analysing and interpreting findings within their context in order to report their results.

## Research Methods

The range of approaches used in educational research to gather data which is used as a basis for inference and interpretation, for explanation and prediction is known as the research methods. The development of procedures for data gathering and data analysis in this research was informed by current literature on research methodology (Denzin & Lincoln, 2000), with particular reference to literature on educational research (Anderson & Arsenault, 1998; Cohen, Manion & Morrison, 2003, Pring, 2000, Yin, 2003). There are several procedures used for gathering the data for this study: the literature on motivation and learning conversations, observation through the form of video, interviews with the teacher and students and a survey with the students.

In order for the results of educational research to be given appropriate credibility it is important that they are framed within a trusted and recognised methodology, which mirrors scientific inquiry. Anderson and Arsenault (1998) suggest five types of qualitative research method: applied, case study, ethnography, grounded theory and phenomenology. The case study is a traditional research method suited to contemporary events in their natural context. This dissertation uses a case study approach research method because it is an intense study of a particular situation in its natural context. It is because the case study is such an intense study of the particular, that Pring (2000) suggests that it is not possible to generalise to other situations. But a case study method does provide a framework for investigation that may lead itself to similar possibilities on a larger scale were the findings to provide interesting ideas.

Case study research is described by Yin (1989) as follows:

Case study is an empirical inquiry that:

- Investigates a contemporary phenomenon within its real-life context, especially when
- The boundaries between phenomenon and context are not clearly evident; in which
- Multiple sources of evidence are used

(p. 23)

A decision to use a case study generally relates to the researcher's interest in describing, explaining or evaluating a specific case. The choice of a case study research design implies knowledge of some interesting issue that sets the general parameters for the

research question (Yin, 2000). Case studies can be single and multiple case studies and they can include quantitative as well as qualitative evidence. There are a variety of types of case study: illustrative, exploratory, critical instance, programme implementation, programme effects and cumulative research. Factors such as resources, depth of investigation, timeframe and who the end users are, will impact on the type of case study chosen (Yin, 1998; GAO, 1990).

## **Research Design**

The design is the logical sequence of events which the type of research uses to make the connection between the initial study question and the empirical data to find a conclusion. The research design will describe the collection and analysis of relevant data rather like a plan, although Yin (1998) cautions that the design is not a plan. The purpose of a research design is to describe a process for answering the logical problem, so it is essential for the researcher to develop an appropriate design to fit the logical problem of the research question.

The case study has been chosen as the design for this research project because the pedagogical change offered by the use of NCEA is an interesting issue which requires multiple sources of data to establish an understanding of the pedagogy in use. The importance of NCEA as a New Zealand qualification and its significantly different standards-based assessment process has propelled New Zealand secondary teachers and students into a challenging change process. NCEA provides an opportunity to examine the use of effective pedagogies therefore a case study could describe one class's experiences to see whether the teacher has made the pedagogical shifts to accommodate the standards-based nature of the NCEA that the literature suggests would be beneficial.

The case study research design comprises five important components:

1. A study's question- what the research is trying to answer
2. Its proposition- what should be examined
3. Its units of analysis-describe what is to be analysed
4. The logic linking the data to the proposition-what patterns emerge
5. The criteria for interpreting the findings –what connection does the data have to the literature

(Yin, 1989)

The manner in which the study question is formed signals the most relevant research strategy to use. The 'how' and 'why' questions are particularly appropriate for case study research because they are being asked about a contemporary event over which the researcher has little control (Yin, 1989). This single descriptive case study's question is :

How do teachers and students in NCEA classrooms optimise the potential for learning centred interaction as research says they should, if the potential of NCEA is to be realized?

The proposition directs the attention to what should be examined within the scope of the case study. This study's proposition is:

That teachers encourage the use of learning centred interaction to enhance student learning in NCEA classrooms.

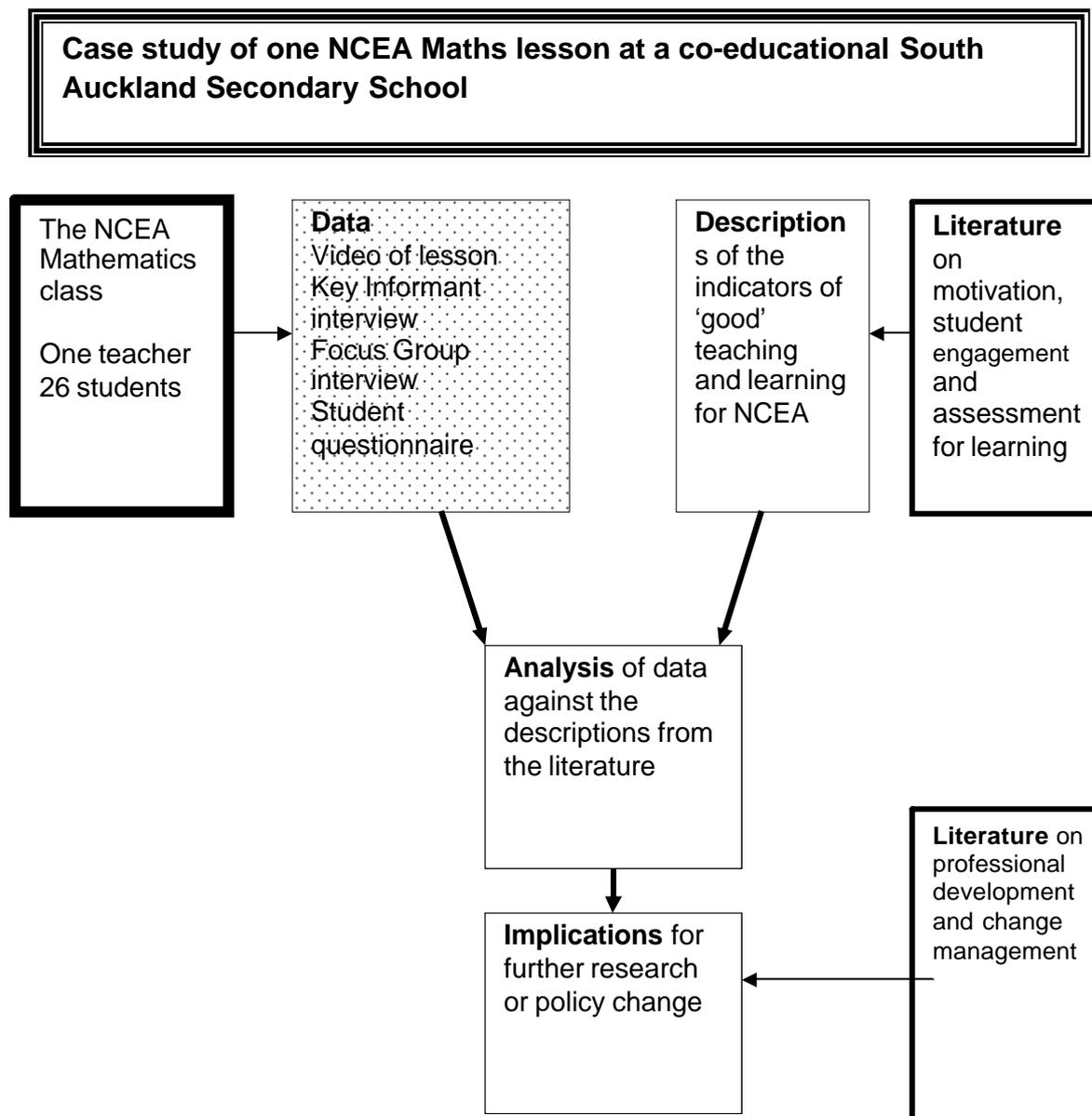
Yin (2003) suggests that defining the unit of analysis in a case study is very important. The findings of the case study will relate to specific theoretical propositions about the defined unit of analysis. So for this research the case study has three units of analysis: the interactions that take place during the lesson; the strategies the teacher uses to help students learn; the strategies the students use to help themselves to learn.

The design includes the analysis after the data has been collected. The fourth and fifth components of case study design require linking data to propositions and criteria for interpreting findings. The criteria for interpreting the findings of the empirical data are the points derived from the review of the literature on effective pedagogy for NCEA. A distinct advantage of case study research over other research methods, is the data analysis that can occur at the data collecting stage which will begin to shape the reflection and subsequent interpretation of events (Anderson & Arsenault, (1998).

In this research study the data on interaction captured from the lesson was analysed to see who was initiating the interaction, the student or the teacher, and the purpose of the interaction. The data was also analysed to see what actions the teacher used that actually helped the students to learn, and also what the students understood about this. The teacher's and students' actions were analysed against the list of behaviours that assist learning described at the end of Chapter 2. These learning focused behaviours are the criteria for interpreting the findings.

## This Case Study Research Design

Figure 1 Case study research design



This diagram shows the descriptive case study research design. From the literature on student motivation, engagement and assessment for learning a key set of predictions of what the teacher should do and what the students should do in the NCEA lesson, were developed. The video, interview and questionnaire will capture the lesson and the interactions within the mathematics lesson. This video data provides information on the actual teaching and learning. This information on the teaching and learning is to be analysed against the descriptions of what the teacher and students might do. This then provides some idea of how the teacher has changed their pedagogy to adapt to the new qualification's standards-based assessments. Finally the literature on professional

development and change management will be used to form a set of recommendations for further research or policy change.

The case study is to show how the existing teaching practices of one NCEA teacher and the learning practices of one NCEA class of students did or did not enable students to enhance their learning. The actual empirical data gathering will capture the student and teacher practices, their motivation and their understanding of what is happening with regards to their learning. These will be examined in the light of the theories drawn from the literature base about the actions of teachers and students. This data will identify whether or not a need for further professional development might be justified for the teacher. The second phase of the research will use the literature base in professional development and change management to suggest the next direction for schools and secondary teachers if they are to increase student achievement in NCEA.

## **Data Gathering Methods**

Yin (1998) suggests that the empirical data in a case study can be gathered from six sources of evidence: documentation, archival records, interviews, direct observations, participant-observation, and physical artefacts. The data base that will be built will form the foundation of the required chain-of-evidence (Anderson & Arsenault, 1998). One of the issues noted with case study research is when to conclude the data gathering, although this would not be a concern if the research was designed around the boundaries of the case study design found in the physical and time boundaries established at the beginning of the research. Yin cautions, “not all sources will be relevant for all case studies” (1998, 95). The documents, observations, interviews, and questionnaires to be collected in this case study will provide relevant information to illustrate the quality of interaction in the one NCEA classroom, the case for this single case study. The fact that the research is only looking at only one lesson confines the sources of data that could be relevant to the case to just those actions that occurred within that lesson.

## **Observations**

Observations are important qualitative data collecting processes. One advantage is that they give the observer the opportunity to gather the information in situ rather than second hand, allowing a valid look at what is really taking place (Cohen, Manion & Morrison,

2003). In a research study such as this one, observation is a preferred tool because the purpose of the research is to see what really happens, not what teacher reflection might say happens. Another advantage of observation as a research method is its capacity for minimising bias. Anderson and Arsenault (1998) describe the research of Edwards and Westgate (1987) who observed teachers talking in class 80% of the time, yet when the teachers were asked, they would report talking only 20% of the lesson time.

Observations can however be problematic. For example, even with efficient coding systems, it is difficult for an observer to adequately record all the conversations and interaction happening in the room at one time that might be of interest. The presence of an observer in the room can also cause people to behave differently to how they 'normally' would (Schaffer, 2000). Additionally, Schaffer (2000) suggests that sometimes the event to be observed is so rare it may not occur at the time of the observation. It is for these reasons that the video recording was chosen as a research tool, to enable a wide range of interactions to be captured for later analysis, to minimise the intrusiveness of observation and to maximise the chances of capturing the 'rare' event.

The video record is a valid tool for collecting data because it collects the data without any bias, just as the situations unfold. It is particularly useful for capturing interaction because not only does it capture what participants say but it also captures the non-verbal language, expressions and movements of the class members. When the video is watched there becomes opportunity for the researcher to use retrospective analysis at leisure and in much greater depth than is possible through live decoding.

The observation itself, when video is used as a tool, takes place after the lesson, when the video is observed by the researcher during the transcription process. If the teacher sets up the video for recording themselves, then the observer need not be present at all during the lesson. If the observer is not present, then the observer per se cannot directly impact on the classroom interaction. But the camera itself can. People can feel shy, self-conscious and reluctant in the presence of a video camera, just like people do in a mirror in front of other people. In this circumstance it is the presence of the camera itself that may distort and influence the nature of the lesson.

One way to overcome this may be through establishing familiarity with its use, using it over repeated lessons so that it loses its novelty value. Schaffer (2000) suggests this as a possible remedy for observer influence also. However, Edwards and Wynard (1987) have

found that research subjects who are aware of video recording devices may well talk more, or talk less, or just talk differently. It was suspected by the teacher in this case study, that the presence of the video camera did make the students behave differently to some degree, mainly in choosing whether to sit in or out of the camera lens range. However, the accuracy of the camera in reducing observer error and eliminating observer bias may well outweigh the disadvantages of the effect of the recording equipment.

## **Interview**

Interview is a means of gathering information for a qualitative methodology and is considered one of the most widely used data gathering methods in the educational context (Anderson & Arsenault, 1998; Pring, 2000; Yin, 1989). An interview can be described as a specialised form of communication between people for a specific purpose associated with some agreed subject matter (Anderson & Arsenault, 1998). Because it is an oral process, any misunderstandings are able to be clarified and it is an ideal opportunity for in depth probing of issues with the subject matter. Interviews are vital sources of qualitative data which can provide high credibility and face validity as the results 'ring true' to participants and make intuitive sense to lay audiences (Sewell, 1997).

Two types of interviews, normative and key informant, are differentiated by their purpose. While normative is associated with statistical analysis and mass surveys by pollsters, key informant interviews are more likely required for the probing of specialist perceptions from people in an appropriate situation. Some of the data for this study will be obtained from a key informant interview with the teacher. Key informant interviews are seen also as a useful way to gain insight into cultures or groups under study as they allow the interviewer to probe for more detail and ensure the interviewees are interpreting the questions the way they were intended (Sewell, 1997; Tolich & Davidson, 1999).

Focus groups are another type of interview where the purpose is to address a specific topic in depth with a group of people who share a common experience relative to the study. The focus group allows the opportunity for respondents to clarify questions and for the interviewer to probe responses. Anderson and Arsenault (1998) write about the conversational environment which can result in deeper and more insightful reflection in focus groups.

A focus group interview will be held with a group of students to aid in the interpretation of

the interactions that occur during the lesson (Krueger & Casey, 2000). The researcher needs to gain an understanding of who is interacting and what the interaction is about, an example where the purpose is driving the action (Kreuger & Casey, 2000). Tolich and Davidson (1999) define focus groups as a discussion focused about particular issues while Krueger and Casey (2000) broaden their definition to include ideas and feelings people may have about something. The strength of the focus group lies in the freedom that the interview process provides for participants to discuss issues of concern. This freedom is also dependent on personalities, moods and interpersonal dynamics between the researcher and the group members, as cautioned by Sewell (1997).

## **Triangulation**

Triangulation is the application and combination of several data gathering methodologies in the study of the same phenomenon, described as the use of multiple data sources to validate research findings (Anderson & Arsenault, 1998). There are four basic types of triangulation: data, theory, investigator and methodological. Data triangulation involves time, space and people; while investigator triangulation consists of the use of multiple rather than single observers. Theory triangulation consists of more than one theoretical scheme in the interpretation of the phenomenon; and methodological triangulation involves using more than one method and may consist of within method or between method strategies and multiple triangulation, when the researcher combines in one investigation multiple observers, theoretical perspectives, sources of data and methodologies. This case study uses investigator triangulation because it is drawing on the observations of the researcher, the teacher and the students to understand the interaction in the lesson. The purpose of triangulation is vulnerable to the effects of prejudicial interpretation therefore it is essential to seek confluence of evidence, and multiple sources of data is one way to build credibility (Eisner, 1998). Both Cohen, Manion and Morrison (2003) and Eisner (1998) caution educational research to seek triangulation of process or method as an essential strategy in ensuring accuracy.

In this research design the triangulation of the classroom interaction will be attained through five additional sources of corroborating information. Firstly the class lesson will be videoed then the teacher will be interviewed to give their interpretation of what happened during the videoed lesson and also to determine the teacher's interpretation of the responses of the students during the lesson. This will happen by taking the teacher through the videoed footage and a transcript of the lesson. Through this interview process

the teacher will be able to also identified a group of students who had conducted most of the visible interaction during the lesson and these students will be invited to take part in the focus group interview.

The third corroborating information will be the focus group interview which will seek the students' interpretation of the videoed interactions during the lesson.

The fourth source of information will come in written form from all students in the lesson. They will be given a photocopy of the worksheet they had worked on during the videoed lesson and will indicate on it which questions they had completed successfully and the ones they had not completed.

The fifth corroborating information will come from a short questionnaire about what they were learning and how well they thought they were progressing with the subject matter and with NCEA.

## **Validity and Reliability**

Validity refers to the extent to which the research information tests what the research expected to find, it is a test of the quality of the research design. Yin (1989) describes four types of validity crucial for case study research: construct validity, internal validity, external validity and reliability. Construct validity is obtained through multiple sources of evidence and by establishing a chain of evidence. Internal validity requires the use of pattern matching, explanation building and times series analyses. External validity requires the replication of the logic of the case study design through multiple case studies and reliability is established through the replicability of the case study by doing another case study. In descriptive case study research only construct validity, internal validity and reliability are appropriate because internal validity is established through a causal relationship and as this was a single case study no such relationship was available (Yin, 1989).

The construct validity in this research study was established by using multiple sources of data:

1. Videoed lesson
2. Teacher interview
3. Focus group interview
4. Photocopied worksheet
5. Student questionnaire

Multiple sources of data are a useful way to establish construct validity because they encourage convergent lines of inquiry. The construct validity in a case study is also strengthened by maintaining a chain of evidence which the structure of this research study provides, with cross referencing of methodological procedures and the resulting evidence. The construct validity is further strengthened when the draft report is read by the key informants but this was not possible within the constraints of this research activity.

The internal validity in case study research is established through the tight and interconnected chain of evidence. The study itself strives for internal validity by trying to understand what is going on in the lesson. The capacity of a reader to follow the analysis and come to the stated conclusion is seen by Anderson and Arsenault (1998) as evidence of internal validity in the case study. It is hoped that this reader can find this in this study.

Reliability is the other form of validity useful to single descriptive case studies. Reliability refers to the degree to which the data is what it says it is and replicable and the goal of reliability is to “minimise the errors and biases in the study” (Yin, 1989, p.45). In case study research design, reliability is established when someone else replicates the case study. Therefore part of the information necessary to be gathered is a step by step process of the research procedure. Yin (1989) suggests conducting the research so that an auditor can repeat the procedure and arrive at the same result.

It is very important that educational research, being largely qualitative in nature, ensures reliable results if their analysis is to have any meaning or confidence (Cohen, Manion & Morrison, 2003; Yin, 1989). In this case study careful documentation of procedures ensured that a replicated study could be carried out. Therefore we can demonstrate that both internal and reliability validity were established through the careful design of the research process.

## **Ethics**

The ethical principles which seem important to educational research are first, the desire to treat the ‘objects’ of the research with respect for their dignity and confidentiality and secondly that the purpose for research is the search for truth. Pring (2000) suggests that sometimes these two principles are irreconcilable. The five key principles of ethical conduct in research are: do no harm, ensure that participation is voluntary, gain informed

consent, avoid deceit and ensure confidentiality. Guidance on ethical issues was sourced from Anderson and Arsenault, 1998; Tolich and Davidson, 1999; Cohen, Manion and Morrison, 2003 and Pring, 2000. Each of the five key principles were given consideration in the design of this research process.

The major ethical consideration with this research design was in the use of students. The students in the research were approximately 15 or 16 years old and were all students in the same NCEA class. The researcher informed the students and their parents in writing about the purpose, procedures, potential risks and discomfort; offered to answer questions; stated that participation was voluntary and that participants could withdraw at any time; and assured them that their identity would be kept private and confidential. Where appropriate, the homes of students who did not bring back their written permission were phoned by the teacher and consent was obtained that way. Informed, written consent was gained from the students and their parents/ guardians, the teacher, the school's Board of Trustees, and the community leaders for the Polynesian students at the school. It was essential that consent was also given to the cultural appropriateness of the process for this research project. All this is an example of due process to maintain the ethical safety for the research participants through informed consent and voluntary participation.

Certain groups of people at times may be more vulnerable to damage as research subjects due to their age, gender, culture or emotional disposition because of an imbalance of power relationships. Location of research subjects is also a concern as students in a school can be seen as vulnerable because they may not have the ability to remove themselves from the research setting (Anderson & Arsenault, 1998). These ethical considerations were known to the school principal who enabled the school counsellor to be available to the research process, and this person was in attendance at every meeting with students that the researcher held.

Consideration was given to possible sources of bias. Previous professional associations the researcher had with the school were viewed as ones of trust rather than bias. Care was given to reduce the possibility of bias by inviting a teacher to take part whom I had not met before. Two distinct independent perspectives can counter bias by the independence of their perspectives. Because the teacher and I had not worked together before we did not have a shared perspective about the research, therefore the interpretations of the data will be independent and any biases will counter each other out.

In addition to this care, the principal of the school made sure that this was voluntary involvement and that the teacher was in no way coerced to participate in the research process. The researcher met with the teacher, explained the purposes of the project, established a process for the data gathering at a time that suited the teacher, clarified the teacher's right to discontinue at any stage and assured them of confidentiality. All meetings with the teacher were at a pre-arranged time that suited them. In fact the teacher helped in every way possible to assist the process to operate smoothly. Caution was exercised with all aspects of the design of the study to avoid any conflict of interest (Anderson & Arsenault).

The lesson took one 50 minute period and the entire lesson was videoed by the class teacher setting up the camera on the desk, the researcher was not present in this part of the process. The teacher operated the camera to reduce the likelihood of the students responding differently to the presence of a visitor to the classroom. The camera was set up in the room during five consecutive mathematics lessons in order to get the students accustomed to the presence of a camera in their educational environment.

The teacher gave all five tapes to the researcher and through the invitation of the researcher, signalled the lesson during which they thought the students showed more engagement and during which there was more interaction, the fifth lesson. This was the lesson that was subsequently used for the analysis. This was another example of voluntary consent, where the teacher by identifying the most interactive lesson, was volunteering her teaching practice and the learning of her students up for analysis. The students also exercised their right to participate voluntarily through their seating arrangements in the class on the days the video camera was operating. Some students chose to sit outside the camera lens range.

The likely participants of the focus group were identified by the teacher and the researcher as they viewed the video. These students were asked if they would please meet with the researcher to talk about their learning. They were given the opportunity to decline to participate in the focus group. Each of the students identified went willingly to the focus group, with the school counsellor acting as moderator. These actions are further evidence of consent. If the students had been unwilling to take part in the process they would have declined the focus group or attended but not contributed. Neither of these actions occurred therefore we can assume that it was a consensual process.

One other ethical concern can arise around a conflict of interest which can exist when a researcher's personal interest influences the objectives of the study and therefore the fairness of judgments and relationships can be put at risk (Anderson & Arsenault, 1998). Although the researcher had a prior association with the school, this association was based on openness, honesty and trust, as evidenced by the principal's willingness to invite a class in the school to participate. So while there was the potential for a conflict of interest, previous involvement with the school as a facilitator delivering professional development to some teachers had established a perception of trust and dependability. Therefore when the request for consent to take part in the research project was sought, it was given freely and willingly and this suggests that the conflict of interest had been handled ethically.

The final ethical concern arises around the pursuit of truth, and the nature of knowledge. Pring (2000) asserts that tension between the ethical dimension of research, the nature of knowledge, its provisional status in the light of the current evidence, the likelihood of new discoveries and the necessary link between openness to criticism and the growth of new knowledge, is important. Of specific concern is the intertwined relationship between politics and power when negotiating in research. "How far can one ensure confidentiality without jeopardising the objectivity and independence of the research?" questions Pring (2000, p.149).

This research design balanced the principles of the right to know with the ethical demands of total confidentiality with both the teacher and the students. Firstly the students are not named within this research, they are numbers on a roll only and it is only the school which can make the historical connection between the students and their allocated number. Therefore the students are effectively anonymous. Secondly the students' perception of the truth of the information imparted for the purposes of research must be based on assumed trust. The students gave their information freely, which the researcher being in the pursuit of honesty and truth, was bound to trust. The frankness of their information suggests that they were truthful. Likewise, the teacher spoke openly and honestly during the key informant interview. Evidence of this came from the unintended reflection on their philosophy of learning. Research subjects are however, at the 'mercy' of the researcher and in the writing up of the results the researcher has taken great care to balance the maintenance of the sincerity of the 'voice' of the research subjects, their anonymity and subsequent confidentiality with the requirements of the virtuous pursuit of truth in the search for knowledge.

## Summary of Chapter

Through the well established literature base which describes qualitative research methods it can be seen that this case study research is designed on established processes. The appropriateness of the qualitative methodology as a valid research methodology for educational research is widely supported. The use of a case study approach has been given validity in the educational fields for obtaining an understanding of the uniqueness of events or actions arising from their meanings being shaped by those who are participants in the situation.

Case study research was established as the research method and the case was defined as a single descriptive case study aiming to examine whether teachers and students in NCEA classrooms actually do what the research says they should if the potential of NCEA is to be realized, and how schools could raise student achievement in NCEA. The purpose of this research study is to describe what teachers and students do in an NCEA classroom and whether this is what the research says they should do if the potential for raising student achievement with NCEA is to be realised. The data was gathered from multiple sources, namely five, using an observation, a video, a key informant interview, a focus group interview and a questionnaire as the research tools.

Triangulation was addressed in the research design so that the multiple sources of data corroborated the conclusion. Single descriptive case study research requires both construct and reliability validity and these were shown to have been met in the design of the research. Ethics were also detailed in this chapter and the research process carefully examined the main ethical issues and demonstrated how these had been met safely.

The next chapter will examine the research findings, beginning with a conventional case study strategy of setting the priorities of what to analyze and why (Yin, 1997). The research activity will be detailed, then each of the sources of data will be examined and where possible they will be triangulated. And finally this will be analysed against the literature base of effective teaching practice which identifies the importance of self-regulating students and the strategies teachers can use to develop these.

# CHAPTER FOUR

## **CHAPTER FOUR**

### ***Research Findings and Discussion***

#### **Introduction**

This chapter examines the research findings, beginning with a conventional case study strategy of setting the priorities of what to analyze and why (Yin, 1997). The research activity will be detailed, then each of the sources of data will be analysed and where possible they will be triangulated.

#### **Aims and Case Study Propositions**

The aim of this project is to investigate the quality of the interactions between students and their teacher in an NCEA classroom, as evidence of motivated students and to establish any link between what students do to enhance their learning, and what the research literature suggests are the most powerful strategies teachers and students could use to enhance the learning. The findings may have implications for the manner in which secondary school senior managers maximise the opportunity with NCEA to improve the achievement of their students and develop within them the skills to be life long learners.

This case study's proposition is based on the central aim detailed above, that teachers encourage the use of powerful interaction to enhance student learning in NCEA classrooms. To find out whether this is true or not, this case study used three processes. The first is to critically analyse the links between the research on assessment for learning and the interactions of a teacher and their students in an NCEA classroom. In Chapter 2 we identified from the literature on effective pedagogy the importance of collaboration and a learning focused partnership between the teacher and their students. An examination of the lesson and the evidence of the relationship between the teacher and their students will show how learning focused and how collaborative the partnership is.

The second process for finding out about the proposition based on the above aim is to critically examine why there are or are not links between the student led interactions in an NCEA classroom and the researched methods of student interaction that contribute to learning. Chapter 2 established the importance of student generated interaction from the literature review around effective learning and effective teaching. Through the analysis of the data I will demonstrate to what extent the students are using the strategies identified from the literature on effective learning.

The third process is to identify a set of implications for senior managers of secondary schools regarding enhancement of the achievement of NCEA students through improving the pedagogy of the teachers. This will draw on the literature reviewed in Chapter 2 around professional development and change management in education. From this we may be able to establish a set of guidelines to strengthen the teaching practice for NCEA teachers in order to enhance the achievement of the NCEA students.

Five sources of data will be used to answer the first two processes:

- Video of one NCEA lesson

- Student questionnaire

- Student focus group interview

- Teacher key informant interview

- Worksheet for unit standard 5226

The third process will use the literature on effective professional development and change management strategies and the implications will be described in chapter 5.

One of the advantages of the case study method is that it draws on multiple sources of data to make its case (Yin, 1989). The manner in which the data was collected is described in the next section about the research activity.

## **The Research Activity**

The research activity will be described in chronological order as this is a descriptive case study and Yin (1989) suggests that the information needs to be made very specific so that such a research project could be replicated. An outline of the procedures for the data gathering process is included in Appendix E.

The research design began with a review of the literature to establish a theory base around the significance of student generated interaction and the imperative of the application of this theory in the standards-based NCEA secondary school classroom. Once the research design had been established the principal of the school was consulted to see whether he thought the study appropriate for undertaking in his school. The principal agreed, spoke about the research to the staff and one mathematics teacher offered to be party to this study. It is essential to have voluntary participants, (Anderson & Arsenault, 1998; Cohen, Manion & Morrison, 2003; Pring, 2000).

A further meeting was held with the principal to establish the data gathering and informed consent processes. The principal presented the request for consent to the school's Board of Trustees and also the community leaders. The principal was eager to use the video as an observational tool as he recognised the challenge for collecting genuine data with this student population and he encouraged the seeking of consent from not only the parents and care givers, but from the students themselves.

I met with the teacher soon after this meeting with the principal and thanked her for her willingness to take part in the study. The meeting with the teacher was held in order to explain the entire data gathering process. It was important that the teacher fully understood the study so that they would be in a position to answer any questions should parents or students require further clarification.

Both the teacher and I recognised the capacity for completeness of evidence presented by a video of the lesson. Yet this was identified by Schaffer (2002) as being at risk of observer influence. In order to minimise the risk I asked the teacher if she would be willing to control the setting up of the video camera in her own mathematics class to capture what the students did to enhance their own learning. Not only did the teacher agree to this, she also suggested running the video camera in the class for a whole week in order to reduce the likelihood of observer influence. This was done to enable the students to become accustomed to the camera, and give them the opportunity to refocus away from the camera and on their learning in the classroom.

On the videoing days some of those students without consent chose not to come to school, other students who had given their consent but who chose to sit outside the camera range. This behaviour supports the findings of Edwards and Wynard (1987) who discovered that research subjects who are aware of the video camera may well behave differently.

Once the video taping dates had been established, I was invited to meet the consenting adult who would chaperone the students during the interviews. The principal had arranged for the school counsellor to sit in on all interactions that I had with the students to ensure that students' views were their own and that their interaction with me was safe in all circumstances. It was apparent from the way the students responded to the school counsellor that they had built up a relationship of trust with her which minimised any threat

they may have felt from their interview with me.

The day after the final videoing had been completed, the teacher gave over all five tapes of the mathematics lessons to me and nominated the lesson considered to have captured the most interactions in it. This was the lesson that was used for analysis. The teacher also supplied me with copies of the exercises the students had been working on in the lessons which were preparation for the NCEA Unit Standard to be sat the following week. These exercises became a useful introductory tool for me to present back to the students in order to obtain some context for their conversations during the lesson. I also prepared a short survey questionnaire for all students who were taking part in the study to complete. The questionnaire was designed to find out from the students how self-regulating they were as learners (see Appendix A.)

The oral component of the video was transcribed, the teacher viewed the video and explained the flow of the lesson and how she interpreted the responses of the students she observed in the video. This interview with the key respondent also provided a catalyst for the teacher to reflect on her teaching philosophy, and for me to recognise the gap so often mentioned between the teacher's theory and their praxis according to Schön (1987). Effective learning approaches require there to be minimal gap between theory and praxis. The data gathering process is outlined in steps in Appendix E.

## **Research Methods**

The data on learning interactions and self-regulated learning was gathered from multiple sources. What each of these sources of data showed will now be described.

### **Video data**

The teacher set the video camera up on a tripod at the front of the classroom set it running. The video tape used for the analysis was the fifth of five lessons videoed. The video tape shows a largely empty classroom, with nine of the 16 students in the class that day choosing to sit outside the lens range of the camera. The teacher mentioned that another ten students had even chosen not to come to school while the videoing was going on. The reaction of the teacher was one of nonchalance, never sure who will turn up to this class on a regular basis and had noted that the students' intermittent attendance did have an impact on their achievement. I would find it interesting to explore what these students

were fearful of. But this was not possible because the students who were part of the focus group discussion were the students who were in the lens range.

The video captures all of the teacher conversations and many of the student conversations during the lesson. The teacher mentioned that she taught just as she usually taught, that she didn't do anything different for the video, so I suggest that this was a valid capturing of the teacher's practice.

Interaction is an event that takes place between a person and their environment usually stimulating a reciprocal event. In this research study, interaction refers to the conversations students engage in either with their teacher or with their peers, which have the potential for enhancing their learning (Timperley 2001). The transcript of the video footage showed 72 interactions during the 57 minute lesson: 13 teacher to student, 46 student to student or student to teacher, 13 teacher to the class. During the lesson the teacher demonstrated on the whiteboard three times and a large part of the rest of the lesson was spent responding to the students' needs, and these largely appeared to be student initiated interactions. Of these student initiated interactions, 24 of the 46 interactions were learning focused, the rest were social, while of the 26 teacher initiated interactions, 11 were about learning and 15 were behaviour related.

In summary the video showed that 64% of the interaction in the classroom was student initiated, although only 52 % of the students' interaction is on learning. Of the combined teacher initiated and student initiated interaction only 49% of it was about learning. This is a predictable finding when some of the actions of the class do not demonstrate evidence of engagement in the learning. (see Appendix D).

## **Student questionnaire**

The effective application of a suitable survey instrument in the form of a questionnaire is the cornerstone of good quality research according to Tolich and Davidson (Tolich & Davidson, 1999). 16 students answered the questionnaire, nine of whom chose to sit outside the camera range despite giving their consent to the research. The questionnaire enabled data on how self-regulating they are as learners, to be collected from all students. The questionnaire is attached in Appendix A.

The researcher visited the mathematics class and explained the questionnaire to the students. All students who attended the lesson and who gave their permission completed the questionnaire. Each student who was present the day the analysed video was taken, was handed the questionnaire and asked to complete it during the lesson, which all except one student did, and this remaining questionnaire was forwarded to me by the teacher the next day. In addition to the questionnaire, the students were given a photocopy of the worksheet they had worked on during the videoed lesson and asked to write on the worksheet which questions they had completed in class and which questions they had found difficult to answer. This method was chosen to provide a quick and easy connection between the questionnaire and the videoed lesson the previous day. The questionnaire sought five responses from the students and all except S11 completed all five questions:

1. what were you learning about in that lesson? And why?
2. What did your teacher do to make the standard of the learning clear for you?
3. How did you check on your understanding of that learning?
4. How well do you think you are doing in this subject in NCEA this year?
5. What is it that helps you to learn about this subject?

The framing of these questions was designed to gather some insight into what sort of agency the students in this class have over their learning, how self-regulating they thought they were. The perception that students need to be agents of their own learning and therefore in control of it has been drawn from the current literature on effective learning (Black & Wiliam, 2006, Harlen, 2006; MOE, 2003; Stoll, Fink & Earl, 2005).

The results revealed a range of responses, from students who knew exactly how many credits they had accrued, how many were still required and where they could gain those, to two students who had very little idea. "I don't think I am doing well in maths. I don't know how many credits I have, we need a credit tracking programme. I expect to get just enough credits to pass maths" (S2Q). Students with low agency and low motivation have been found to attribute their NCEA success to 'luck' while self-regulating and highly motivated students have shown that hard work brings success (Meyer et al, 2006).

The students' responses to the first question, 'What were you learning about in that lesson? And why?', revealed a discrepancy with what the teacher thought the students were learning. Nine of the students thought they were learning "something about graphs and graphing information", which to some extent was what the exercises were requiring the students to do. In contrast, the teacher had intended that the students needed to learn how to understand the logic of each problem in order to be able to think through the

solution and this doesn't seem the same intent as what the students had picked up. Herein lies one of the critical points of current assessment for learning research (Black & Wiliam, 2006, MOE, 2003; Stoll, Fink & Earl, 2005), that while teachers think they are clear about what the students need to learn and may well have designed experiences for them that they believe will enhance that understanding, students often do not know the teacher's intentions, nor can they derive them from the designed learning experiences (Black & Wiliam, 2006).

In response to the second question, 'what did your teacher do to make the standard of that learning clear to you?', six of the students' responded that the teacher demonstrated the standard on the whiteboard. The students seemed pleased with this level of support. But the teacher on the other hand, was unhappy with the students' reluctance to take risks and seek deeper understanding. They did nothing until she had written the solution up on the white board. The teacher felt that the students' responses were a valid reflection of their usual learning and understanding and that their involvement in the lesson was pretty 'normal' despite the presence of the video camera. So more than half the class were not clear what quality or standard of work was required or what their teacher had done to make that standard clear for them. In mathematics, a teacher can make a standard of learning clear for students by demonstrating the problem solving process by modelling it on the whiteboard. Generally, when a teacher in mathematics does this, they voice the mathematical logic to the problem solving process as they proceed, thereby defining the criteria that will assist students to use the same method. And in this way, students see a demonstration of how to solve the problem and are given the opportunity to try it out for themselves.

A critical feature of a demonstration is the timing, it depends on the intent. Is it demonstrated at the beginning of the lesson for students to copy as a sample of best practice, or later in the lesson for students to compare against their own attempt? The teacher demonstrated at 11:52 (11 minutes and 52 seconds into the lesson), 22:20 and 52:33 (3 ½ minutes before the end) during the lesson. The teacher made it clear to me that she was wanting the students to think for themselves and work out the logic in the question so she demonstrated the process only when she perceived that the students had attempted the question themselves. The teacher reflected in the key informant interview that it was a skilfully judged time as she was mindful of the proportion of the class who do not engage in the thinking, who are not risk takers and who rely on the teacher's demonstration for the example or standard of best practice to copy.

The third question, 'how do you check on your own understanding of that learning?' was referring to the learning context of the previous two questions. Only 12% of the students interpreted this question as checking their answers when the teacher demonstrated the problem on the board, but a 38% of students also mentioned that they ask the teacher to come and look at their work and she will tell them if they have got it right. 12% students did say that they looked at their own work themselves and that they checked their work with their friends in class. Both of these responses indicated students who are regulating one aspect of their own learning. Sadler (1998) argues that students who self assess make significant gains in their achievement.

The fourth question revolved around what students know about their accumulation of credits for NCEA mathematics, 'how well do you think you are doing in this subject in NCEA this year?' 88% of the students were able to describe how many credits they had accrued and how many more they required to attain Level 1 mathematics in NCEA. Their responses showed that where they had achieved the full quota of eight credits required for NCEA Level 1, they had gained these through 'internals', that is through internally assessed unit or achievement standards. This finding corroborates the findings of Meyer et al, (2006) who reported reactions to NCEA: "These included generally positive perceptions regarding the impact of internal assessment on both teaching and student learning; more opportunities for success by lower achieving students who might otherwise have failed;" (p.5).and NZQA's (2006) findings from a survey of New Zealand NCEA students that 64% of Level 1 candidates preferred internally assessed standards. Reasons for this preference support Meyer et al's findings, "it was less stressful, they had more time to prepare, that the subject was fresh in their minds when assessments were undertaken, and that they could re-sit the assessment" (NZQA, 2006, p.2). Conversely the response from one of the students in this case study found that "it can be stressful after lots of retests to get the credits" (S23Q). So one student in this class is finding internal assessments stressful.

Being so successful for these students was not what they had expected, "I'm doing alright but that's not what I expect"(S3Q), and, "I never expected to get them but I did"(S4Q), and, "I am doing better than I expected"(S24Q). This question told me that students have knowledge of their progress on NCEA which can be motivating if it is perceived as value for making an effort to achieve the unit or achievement standard. It also suggested to me that some of the students in this class did not perceive themselves as successful learners prior to NCEA and that the internal assessment has been a positive experience for them.

Perhaps NCEA had changed their sense of themselves as successful learners? I was not able to follow up on exploring this issue as I had no opportunity to read the questionnaire responses prior to leaving the classroom.

The fifth and final question in the questionnaire explored what students did to help themselves learn, to see whether they were active, dynamic learners that used effort and energy as Stoll, Fink and Earl (2005) suggest a good learner should. Some of the students stated that they would talk it through with their classmate or buddy or teacher, "I ask my friends and try to do it myself" (S2Q), while others stated that they would listen hard to the teacher and concentrate in class. The question was worded as, 'How do you help yourself to learn about this subject when you are in class?' One student even wrote in response to this question, "I try to do my work and don't talk with my friends" (S13Q) which suggests that the notion of talk for this student may be unrelated to learning. So there are several interpretations of information here: some students talk to their friends and ask questions of their teacher and try it for themselves, others listen hard to the teacher and concentrate, and one student felt that talking in class was unhelpful. These mixed responses capture some sense that students learn in different ways. Although Timperley (2001) argues that student conversations about their learning can actually help them be more effective as learners.

In summary, the questionnaire was designed to capture what sort of agency these students had over their learning, how self-regulating they thought they were. Most students knew how well they were going with NCEA, how many credits in mathematics they had accrued through the 'internals' and how many still to get. This showed that the transparent nature of the standards-based-system of NCEA assessments that has been written about in the literature, was evident in this class (NZQA, 2006). In this lesson students were not aware they were learning how to develop a methodology for problems solving although the teacher thought they were. More than half the class either misunderstood the 2<sup>nd</sup> question or else they failed to recognise the purpose of the teacher demonstrating the problem solving approach on the board. In general students chose to look at their own work to see how they were progressing with their understanding although other students sought teacher feedback on this. Some students help themselves to learn by talking their understanding of a concept over with someone else, these students are demonstrating active learning skills, other students do not see talking as helpful. The students who take an active part in defining what is to be learnt, the manner in which they learn it and the assessing of it – all with the aim of increasing their achievement, have agency over their

learning and they are self-regulating (Absolum, 2006; Black & Wiliam,1998; Crooks,1998; & MOE,2003, Stoll, Fink & Earl, 2003).

### **Student focus group interview**

The five students that the teacher and I had recognised as having interacted most in the videoed lesson were invited to take part in the interview where they watched a video of the lesson and explained what they were doing in those observations. It was essential to the validity of this research project that I sought student interpretation of their own interactional experiences during the lesson. They answered the following questions as each interaction arose in the footage: Who were you speaking to? Why? How did it help you with your learning? See Appendix B.

As the students watched their actions on the video a theme of seeking support from their teacher began to come through as a reason behind their interactions. One student reflected in the following way, “what do I do on question 5? Because I didn’t know that question. The teacher explained it to me so I did it (now I know how to do that).”(S13FG) Another said, “How to do it. How to do the graph. I needed help. The teacher taught me how to do the graph”(S24FG) or “I asked the teacher how to do number 3”(S26FG). I observe how ever that each of these students was seeking support from their teacher to find a method for finding the correct answer to the mathematical problem they had been given which is not the same as seeking a methodology for solving problems as the teacher had expressed.

One student stated that he hadn’t engaged in any conversations about his learning as his conversations had all been social, about what his friends had done during the recent weekend, “I was asking people what they’d done during Labour Day. This did not help my learning because I was out of topic”(S11FG). This student’s response is an example of Cowie’s 2004 findings, that when students are in any classroom activity they are balancing three goals simultaneously, namely completion of work tasks, effective learning and social relationship goals. She notes that when these conflict, students tend to prioritise the social relationship goals at the expense of the learning goals. Perhaps that is what this student did.

Another theme that arose from the focus group interview was the value of one to one exchanges to help students learn. This theme arose from the question ‘who did you talk to

during the lesson to help you with your learning?’ There was an even balance between talking with their teacher and talking with their peers, yet regardless, the students conceded that this conversation helped them with their understanding. “it helped me to finish the question; it helped me understand the question better” (S20,24FG). This is in support of the concept that learners look for thoughtful suggestions, preferably in one to one exchanges, in order to complete their work (Cowie, 2004).

There is an interesting point to explore here in this dialogue: what was the nature of that conversation that the student found helpful? Was it one where the student asked ‘do you know how to do this?’ and the respondent said, ‘like this’? or was it more collaborative in its nature where the participants made sense of the problem together through their conversation? The audio quality of the video was not clear enough to ascertain this and the focus group questions I asked did not explore this point, yet the literature suggests that conversation about learning is at the very heart of creating understanding and assisting the students to learn (Bishop & Glynn, 1999; Bruner, 1996, Timperley, 2001).

The final question of the focus group interview was more global in nature and explored the idea, ‘what did they find helped them to learn?’ The students’ responses were interesting and some key themes arose:

- Positive fun teachers

- Teachers who can explain things clearly

- A safe classroom environment

- Each student being given the same amount of attention

- New interesting and challenging [ideas]

These themes are similar to those identified by Hawk et al (2001) where they identified that effective relationships between teachers and their students needed to have empathy, be caring, show respect, go the extra mile, have the passion to enthuse and motivate, believe in the student’s ability, be patient and persevering. In fact Hill and Hawk (2000) state, “a positive relationship with the teacher is a prerequisite for learning” (2000, p.3). One student’s response shows that learning is his responsibility, “somebody to explain it to me if I don’t know and also challenging myself to do without anyone’s help” (S20FG). So he sees that learning is a process of being challenged to find one’s own solution. While another student’s response shows again Cowie’s (2004) concept that social issues get prioritised over learning issues, “I did not talk to anyone about my learning because I was busy stranded in my own world”(S11FG). Here again is a student prioritising their own internal turmoil over the opportunities to prepare themselves for an NCEA unit standard, or

further learning in mathematics. This is an example of a student who is not motivated to learn in this lesson, Stoll, Fink and Earl (2003) show that motivation is closely related to knowing what difference the learning could make for them, the amount of connection it has to their own personal experiences and the degree of risk that the learning poses for them.

The students' responses to the questions were recorded and a brief transcript of these was analysed to produce these results. After the students had viewed the video segments they completed these questions in written form so that they made their own record of their responses to these questions for me. These were used to triangulate the teacher's interpretation of the interactions and my own transcript of the video footage in order to capture the quality of the interaction during the lesson.

In summary, the focus group gave clarity to the content of the interactions evident in the video which aided in the interactional analysis coding found in Appendix D. It also provided corroborating evidence of several learning, engagement and relationship theories which support the importance of student engagement for effective learning. The focus group discussion showed that the students sought the teacher's assistance and support for a lot of their learning, which is evidence of a learning focused relationship that they have with their teacher. The student's engagement being influenced by their own beliefs in themselves as learners, their sense of self efficacy and the supportive learning focused relationships they have with their fellow students and their teacher.

### **Teacher Key Informant Interview**

The first purpose of this interview was to gain the teacher's interpretation of the interactions in the video. It was also very useful to have the teacher explain their teaching approaches during the course of the lesson, which removed the conjecture from my sole interpretation. This participant interpretation is a key feature of case study research (Yin, 1989). Two main questions were used as prompts during the viewing: 'Who were they speaking to?' and 'Do you know what they were speaking about?' In most cases the teacher was very aware of what was happening in the lesson and was able to answer these questions. One interesting point that did arise during this process was the evidence in the video of one hard working student who sought the teacher's assistance, but whom the teacher did not see. The teacher was amazed at how patiently and for how long this student sought help. The teacher said she would talk to the student about this at the next lesson.

The teacher explained what she thought was going on in the interactions she identified in the lesson, the times when people talked together. When the teacher explained what she was talking to the students about it became apparent that 34% of this interaction was about assisting students with their understanding, scaffolding, prompting them to understand the logic, read the instructions and giving them help as we would expect any teacher to do. 22% of the interactions were behavioural such as, “get to work please” (TB6IA) and “stop talking and listen” (TB4IA).

Anderson and Arsenault, (1998) recognise that one of the values in case study research is the opportunity to gather additional data in situ. The discussion about the video led smoothly into the teacher’s philosophy of learning, although this had not been an aim of the design of this key informant interview. Half way through the video the teacher reflected, “but many of the students sit and talk until answers are put on the whiteboard and this misses the point because the importance was for them to discover how to solve the problems themselves because when they’re told (the answer) they don’t remember it but learning through discovery is better than being told something because then they have ownership of the idea”(TVKI). This point is given importance by the teacher, it is the core theory underpinning the design and management of the lesson. Yet it is possible that the students did not see this. There appeared, in the way they were responding in the lesson, to be an expectation that the teacher would show them how to answer the questions and that they would wait until the teacher did that. So there is a disconnection between the teacher’s theory of learning and that of the students’. Perhaps the point of a learning-focused relationship is to be able to develop a shared theory of learning.

Once the video had been viewed and the teacher’s interpretations of the interactions had been given, we moved into the interview questions. These may be seen in Appendix C.

1. What were the students learning about in that lesson and why?
2. How did you make the standard of that learning clear for them?
3. What opportunities did you make available for the students to talk with each other or with you to clarify their understanding?
4. How do your students know how well they understood the lesson?
5. What will you do about that understanding?
6. What do you do in class to assist them specifically with NCEA?
7. Have you changed your teaching practice as a result of NCEA and has this made any difference to student learning?

Around these questions, additional questions were asked if I felt I did not understand the teacher's answer. The teacher's response to the first question about what the students were learning was most interesting. The teacher, like the students in their questionnaire, also said they were learning about graphing. Yet when watching the video the teacher had stated that they were learning about problem solving, "I wanted them to experience the challenge of thinking and solving something for themselves" (TVKI). The activities in the lesson seem to have been specifically designed to provide 'teachable moments' although the people to be taught were not so sure that this was the aim of the lesson's design. Absolum (2006) states, "unless both teacher and student are clear about what is to be learnt and how it is to be learnt, then teaching and learning will collapse" (2006, p.22).

When answering the second question about 'how the teacher made the standard of learning clear to the students', the teacher interpreted the question in a different way as, 'how did you explain the purpose of that learning?' This was evident from the response given, "I told them at the beginning that this was like the unit standard they would be doing" (TQ2KI). By rephrasing the question the teacher was able to show me that they were conceptualising the idea at a metacognitive level when they said further, "I told them that I couldn't teach each separate question. But it was skills that they were using. Reading the work, reading the headings, thinking through and understanding it. Basically I used this paper that I gave them to try and build a methodology for them" (TQ2KI). So from this answer I can see that the teacher did have this idea clear, but the connection was not made by the teacher in the board demonstrations during the lesson, that these were what the methodology required, and therefore the students did not have clarity of this concept of how to proceed through the problem solving.

By building a 'methodology' for them the teacher is meaning, build a problem solving process and strategy for them. This is an example of Black and Wiliam's (2006) point where teachers equip students with the cognitive strategies required to achieve new understandings in mathematics. My point is, the students need to know that they are trying to do this and only one of the students showed any indication that the point of the lesson was about 'interpreting graphs'.

The third question in the key informant interview aimed to explore how the teacher viewed the concept of student interaction in the lesson. So in response to the question, 'What opportunities did you provide for the students to talk with each other?' the teacher said,

“There are plenty of opportunities for them to talk with each other. You could tell from all the noise in the room. And as I was going around answering questions, checking on individual students and working at the board, they could respond and answer questions. They had plenty of opportunities to respond and ask questions” (TQ3KI). This suggests that the teacher considers a student’s role in the lesson to be one of either responding to or asking questions. This thesis is about student motivation and engagement, and one indicator of this is the initiation of interaction and a desire for greater understanding through learning conversations. Most commonly this understanding is attained through discussion with someone else, where the student leads a conversation around the concept they are trying to grasp.

The fourth question was examining what processes the teacher has set up for the students to know how well they understood that lesson. The teacher replied, “Whether they got the right answers. Those who tried like 2 and 5 and 15 and 19, they would know if they got the right answers. They would feel comfortable with that. So that’s why they go over to the board. Others who haven’t tried, they would know. Other things seem more important in their minds to them”(TQ4KI). The teacher appears to see getting the correct answer as the means by which she as well as the students know how well they are doing. Yet the teacher spoke earlier in the interview of wanting the students to experience the challenge of thinking and solving something for themselves.

If the teacher wanted students to experience thinking and solving something for themselves then the teacher would need to avoid providing a completed solution, and instead spend time exploring the thinking and problem solving processes that the students came up with in order to build a rational logic for the problem solving process. Steps in the problem solving process would then be able to be linked to the steps required for the forthcoming Unit Standard for NCEA. Black & Wiliam (2006) argue that the metacognitive process required in the teaching of mathematics do need to be focused on in the lesson if students are to acquire them. This is a very different approach to the teaching off this aspect of mathematics than the teacher actually demonstrated on the video.

The fifth question probed this approach and the notion of student interaction further, ‘What will the students do with this understanding of their learning?’ and the teacher responded in a legitimate manner for the timing of this process, being that it was only a few weeks away from the external examinations for NCEA. The teacher responded, “When they come to the next standard they will be able to attack that with more confidence, so they will

hopefully be able to use that in the future. That is the whole point of it really” (TQ5KI). This seems a valid reason for the lesson and the teacher does explain this at the beginning of the lesson. The students though were not able to cite this in their questionnaire or their student focus group interview, as a reason for their lesson. Which is another example of the lack of clarity for the students and the lack of the true learning-focused partnership with their teacher.

The final five questions were all around the teacher’s adaptation or response to the use of NCEA, and these elicited the teacher’s professional disquiet with the standards-based nature of the assessment system. The sixth and seventh questions were, ‘What do you do to assist your students specifically with NCEA? and Have you changed your teaching practice or style or pedagogy as a result of NCEA?’ These questions were asked separately and then re-asked to find just what the teacher was saying in her response, which was, “The same as I did before NCEA. To help them understand the questions so they will learn the skills to be able to attack any question with those skills” (TQ6KI). I should have probed this question more. It was evident from the videoed lesson that the teacher gave them practice questions, that they spoke about the significance of that learning in terms of the assessment expectations and that the teacher told the students about which questions were the ‘excellence’ ones that they needed to focus on. This is consistent with assessment for learning literature about making standards explicit (Black & Wiliam, 2006; MOE, 2003).

The teacher then reflected some more on the impact of NCEA to her teaching practice and its value to the types of students in this class, “In some ways it has [changed] because you’re not aiming for a whole exam for the end of the year. You’re aiming to peak them to understand a block of work, to get them to a certain level”(TQ7KI). This teacher is supporting the literature of Absolum, (2006); Black and Wiliam, (2006); and MOE, (2003), who all argue that there is a link between successful learning and students having specific and attainable goals.

The teacher continued, “in effect you pick out part of the syllabus and you would do those parts more thoroughly and other parts which you know are not going to be examined would get neglected” (TQ7KI).I read into this response the teacher’s criticism of what has been left out in terms of curriculum coverage because of the way in which the assessment standards have been defined. A key issue here is the recognition by the teacher that the ‘syllabus’ and the ‘assessment’ do not match, which has been noted as a criticism of the

design of NCEA by Hall (2000). The important point of NCEA is that as it uses standards-based assessments, which, when everything is working well enable the assessment, the learning goals, the teaching and learning methods and activities and resources to all be in alignment around the same key concept (Hall, 2000).

I probed the issue further, 'Have you changed your teaching practice?' And the teacher continued to assert that there was no change, "no, no, not really, no, not in the way I teach, just in the overall structure of what I am going to teach and peaking them at certain times." This is an important point as the curriculum content assessed for NCEA seems to be informing how this teacher selects and packages the mathematics curriculum, rather than teaching mathematics as a field of knowledge. This is a well researched constraint, where teachers are forced to balance the wider field of knowledge in the subject against the tight curriculum required for the assessment, the more important the assessment the tighter the curricular constraints (OECD, 2005).

As I still needed to find out whether the use of NCEA had made any difference to the student learning, I continued to probe, and the teacher said that yes for some students there had been benefits from the use of NCEA. Then the teacher added, "not a difference for student learning but more student achievement. Students like S2 can achieve more" (TQ7KI). What can be interpreted in this response is that for some students NCEA can enable them to achieve more, although because I failed to explore this with the teacher I cannot be sure of why she thinks this. It could be because the Unit and Achievement Standards have transparent criteria so students know what is required to achieve, or it could be because the assessments are discrete finite units of knowledge which may make them more attainable to more students.

In summary, this key informant interview provided me with important professional information on what the teacher saw as the value of NCEA. It also gave me insight into their teaching philosophy and therefore enabled me to understand the nature of the videoed lesson better. The questions probed the teacher to reflect on her practice around some important teaching strategies that the literature on effective pedagogy identified as making a considerable difference to student achievement. It appeared that many of these pedagogical aspects were not clearly understood by the teacher suggested to me that the teacher could benefit from professional support to understand and apply them.

## **Triangulation of the five pieces of data**

The purpose of using multiple sources of data was to enhance the capacity to answer the study question richly and deeply. In the design of this data gathering process it was hoped that the video would produce the same sort of information as the student questionnaire, the focus group interview and the key informant interview. What was obtained was a triangulation of the interactions evident in the video from the students' focus group's and the key informant teacher's interviews. Each interaction evidenced in the video was explained in the interviews by both the teacher and the students, the people involved in the interaction. The interviews were the most useful data as the auditory quality of the video meant that some of the interactions were observed but were unable to be heard, and it was essential to this data gathering process to know what was said.

The student questionnaire provided a triangulating link between the teacher interview and the video to gain some understanding of how self-regulating the student were and what the teacher did to encourage this. This link was evident in two aspects: firstly in what each party, the students and the teacher, thought was to be learnt in the lesson; secondly how the students found out how they were getting on with their learning. The literature on motivated learners suggests that learners who are self-regulating will actively engage in processes to see how their learning is going (Harlen, 2006). The teacher in the key informant interview, expected the students to mark their efforts in problem solving as they were demonstrated on the board. Conversely, while this appears valid, there is evidence to suggest that some students who are self-regulating needed to know how they were getting on sooner than that, and they would ask their peers rather than wait for the demonstration from the teacher. Some of this evidence was captured on video and the questionnaire response and the focus group responses triangulated the video evidence.

Almost all students were able to show on the photocopy of the worksheet that it wasn't until question 5 that they encountered a challenging problem that required deep thinking. If a teacher is going to respond to the needs of their students it is possible that they could have begun with the challenging question, in order to start the lesson by clarifying the strategies students would need to use to find a solution. It is also possible that if a teacher began with the more challenging problem there could have been greater engagement from the students as they observed that this was a problem they would have been unable to solve unassisted. There is evidence from the teacher's choice of the learning experience

that the teacher did know the learning capacity or ability of the class, well. So it is interesting to speculate why the teacher didn't take the lesson to that next cognitive level and engage with the students in the area that most required assistance right at the beginning of the lesson.

### **Summary of Results from the data**

The video captured the interaction present in the mathematics class, showing that interaction in the lesson was mainly student led, and only some of the interaction was on learning. This was a predictable finding when some of the actions of the class were off task and did not demonstrate evidence of engagement in the learning.

The questionnaire was designed to capture how self-regulating these students thought they were. It showed that they sought help from their teacher or each other when they were having difficulty with their learning. Most students knew how well they were going with NCEA, how many credits in mathematics they had accrued through the 'internals' and how many still to get. This showed that the transparent nature of the standards-based-system of NCEA assessments that has been written about in the literature, was evident in this class (NZQA, 2006).

In this lesson, however, the questionnaire elicited that the students were not aware they were learning how to develop a methodology for problems solving although the teacher thought they were. More than half the class either misunderstood the 2<sup>nd</sup> question or else they failed to recognise the purpose of the teacher demonstrating the problem solving approach on the board. In general students chose to look at their own work to see how they were progressing with their understanding while other students sought teacher feedback on this. Some students helped themselves to learn by talking their understanding of a concept over with someone else, these students are demonstrating active learning skills, other students did not see talking as helpful..

The focus group gave clarity to the content of the interactions evident in the video which aided in the interactional analysis coding found in Appendix D. It also provided corroborating evidence of several learning, engagement and relationship theories which support the importance of student engagement for effective learning. The student's engagement being influenced by their own beliefs in themselves as learners, their sense of

self efficacy and the supportive learning focused relationships they have with their fellow students and their teacher.

The key informant interview provided me with important professional information on what the teacher saw as the value of NCEA. It also gave me insight into their teaching philosophy and therefore enabled me to understand the nature of the videoed lesson better. The questions probed the teacher to reflect on their practice around some important teaching strategies that the literature on effective pedagogy identified as making a considerable difference to student achievement. The fact that many of these pedagogical aspects were not clearly understood by the teacher suggests to me that the teacher could benefit from professional support to understand and apply them.

The data from this study has shown that 12% of the students are self regulating, but that 88% in this class are not. The literature suggests that students who are not motivated, engaged in learning and self regulating will find achievement challenging and difficult (Harlen, 2006). Therefore it would be advantageous for these students to be taught 'how to learn' if they are to maximize the opportunity for achievement available through the standards-based assessments in NCEA. It comes back to the teachers and how they teach, and Starkey et al (2006) and Meyer et al (2006) suggest that this needs to be the focus of further professional development around NCEA.

The final and fifth chapter of this case study will examine these results against the literature base of effective teaching practice which identified the importance of self-regulating students and the strategies teachers can use to develop these. Through the findings from the literature on effective professional development and change management I will establish recommendations for further research and policy directions.

# CHAPTER FIVE

## **CHAPTER FIVE**

### ***Analysis and discussion of results, interpretation, recommendations and conclusion***

#### **Introduction**

The previous chapter examined the data gathered for the research project around the quality of initiated interaction in one mathematics class and how self regulating the students were and the actions of the teacher which supported this.

This case study's question is:

How do teachers and students in NCEA classrooms optimise the potential for learning centred interaction as research says they should, if the potential of NCEA is to be realized?

This chapter will now examine the results expressed in chapter 4 against the literature base of effective teaching practice which identified the importance of self-regulating students and the strategies teachers can use to develop these. Through the findings from the literature on effective professional development and change management this chapter will establish recommendations for further research and policy directions.

#### **Analysis and discussion of the results**

If students are going to make the most of their opportunity to gain an NCEA qualification at school then they need to know how to be effective learners. The way teachers work with students can help them to become effective learners and subsequently to have success in the assessments for NCEA. In chapter 2 the standards-based assessments with NCEA were analysed in order to identify what the literature suggested were the pedagogical practices which would best enhance student achievement. This literature around effective pedagogy has suggested specific teaching strategies that help students to become self-regulating learners in order to answer the case study question: How do teachers and students in NCEA classrooms optimise the potential for learning centred interaction as research says they should, if the potential of NCEA is to be realized?

Therefore this section has examined the data and analysed it against the six teaching

strategies described at the conclusion to chapter 2:

1. A strong sense of partnership between the students and the teacher, where the students have been give a choice about what units to study and are motivated to learn and engaged in their learning

From the transcript of the video I was able to ascertain that the teacher did not provide students with a choice about what unit to study in this lesson. From the viewing of the video, however, despite this lack of choice given to the students, it was evident that two of the students in camera range were motivated to work hard as they appeared engaged in their learning, trying to complete the exercises and make sense out of the questions. The strength of the teacher/student learning-focused partnership was evidenced in the student initiated interactions, where 24 of the 46 interactions, (52%), were learning focused and sought support from either their teacher or a classmate. This was evidenced in the video and corroborated in the focus group interview and the key informant interview. Bishop and Glynn (1999) described the importance of the conversational interactive learning process to student motivation, engagement and achievement, as have Stoll, Fink and Earl (2003). The engagement of two students in the camera range works out at 25% of the viewable population; therefore I cannot state that the students were motivated, although 25% were. In this case there was not a strong sense of motivation as only 25% of the students were demonstrating signs of engagement in their learning. This is not indicative of a sense of partnership.

From the student survey and the focus group interview the students gave no indication of being given a choice by their teacher about what unit to learn about in this lesson. The video also showed some students who throughout the lesson were not engaged in their learning demonstrating no evidence of motivation to learn. Motivation for learning is described by Harlen (2006) as the 'engine' that drives learning (2006, p.61). The teacher told me in the key informant interview, that the students only had a further three weeks at school before they sat the externals for NCEA, so the video was taken at a particularly crucial time for the students. As they all knew about the impending nature of these assessment opportunities it could be expected that there would be a fairly high degree of motivation and engagement across the class. The data did not show this.

2. The teacher focuses on the NCEA Achievement or Unit standard, assisting students with their understanding of the criteria and how they are progressing towards these

This lesson was all about improving students' capacity to meet the criteria for Unit

Standard 5226, element 2 using graphs and tables (derived from the information on the worksheet handed to the students). Not at any stage of the lesson did the teacher refer to this unit standard in this way. The teacher told the students that this worksheet was like the Unit Standard they would be doing the next week (TVKI). So while the teacher is providing students with a reason to work on the activity, the students were not specifically made aware of the criteria for unit standard 5226 and quite how this worksheet which is the context for the mathematics lesson would actually assist them to achieve it. This was ascertained from observing the video and the transcript of the video, from the student questionnaire and also from the worksheet of exercises given to the students.

I also needed to ascertain how well the students knew about their NCEA progress so in the questionnaire the students answered a question “How well do you think you are doing in NCEA this year? How many credits have you got? Is this what you expect to get?” Twelve of the sixteen students who completed the survey were able to state how many credits they had obtained in mathematics and that this was what they expected or better than they expected. Four students were unable to state how many credits they had obtained. One student responded with “I don’t know how many credits I have. We need a credit tracking programme.”(S4). This result supports Meyer et al’s (2006) findings that motivated NCEA students are aware of their progress, yet unmotivated students are not. This 75% result might be from the motivated students and the 25% who don’t know their NCEA progress might be the demotivated ones.

However, on a deeper level, each Unit and Achievement Standard has criteria and if a student is to be assessed on these then the literature suggests they ought to know what they are (Black and William, 1998, MOE, 2003, Sadler, 1998). Therefore I was looking for students who were able to articulate that they were working on the 2<sup>nd</sup> element of the Unit Standard using graphs and tables. These students did not give any indication in the focus group interview or the questionnaire or in the video, that they knew what Unit Standard or which criteria this lesson was preparing them for.

In conclusion, students were not clear about the criteria they were working towards nor that the activities in the lesson were about using graphs and tables. 75% of the students were able to describe how many Unit Standards they had accrued and how many they needed. The 25% who were unable to do this may lack motivation, enthusiasm and interest in their mathematical learning.

3. The teacher negotiates with the students about what needs to be learnt so that there is a shared clarity for both the student and the teacher about what the student needs to learn

The teacher told the students they were “learning about graphing and about attacking questions if you get something unfamiliar...to go through some processes of logic and sequencing to get them to go through the practice.” This was established in the key informant interview. The transcript of the video elicited the following information from the teacher when they spoke to the class setting up the lesson during the first two minutes:

“What I have for you, I have a worksheet for you to do. It is practise for this Unit Standard we’re doing. You’ll be doing the practise work. I’ll be setting the work, I’ll be giving you time to do it and then I’ll go over it on the board. This unit standard on tables, I cannot give you individual teaching on each question because the questions that are going to come up will be different. You are going to have to understand the logic, what each tables about. You’ll have to read and think. You have to do a lot of thinking for this one” (TVKI).

In this transcript the clearest indication the teacher has given for which Unit Standard the students are working on is “this Unit Standard on tables”. In this transcript there is no indication from the teacher of negotiating with the students as to whether this is what they need to work on. The teacher has decided what the students are doing. What they might have been learning however, has not been made explicit. The notion the teacher expressed in the key informant interview of “learning about graphing and about attacking questions if you get something unfamiliar...to go through some processes of logic and sequencing to get them to go through the practice”, was not clearly expressed in the lesson. So the students weren’t able to explain that they were learning this either.

This is confirmed by the lack of clarity expressed by the students. In the student survey they were asked “What were you learning about in the maths lesson?” Their answers ranged from “I didn’t learn much because I’ve already done this work at intermediate” to “grids and stuff”, “graphs and tables”. Only one of the sixteen students actually responded with “interpreting graphs”, which was closest to the teacher’s “You are going to have to understand the logic, what each tables about”. Absolum (2006) expresses the concern of this lack of clarity about what precisely is being learnt “Shared agreement and understanding between teachers and students about what is to be learnt and why is also critical because it’s not that students can’t learn, it’s that they don’t want to or can’t see the point. The problem is motivational rather than cognitive” (p.94). Therefore if Absolum’s

statement is correct we could expect this lack of clarity between the teacher and the students having an impact on their motivation to engage in the learning.

Lack of engagement with the learning was evidenced in three students within the camera range, two of whom did not appear to attend to the exercises at all and a third who became disengaged within the first 15 minutes of the lesson. Also, 38% of the class chose not to come to the lesson. Choosing not to come to a lesson is also a sign of lack of engagement and lack of motivation. The literature around self-regulating learners suggests that if students can see why they need to learn something there is a greater chance they will be motivated to do so (Stoll, Fink & Earl, 2005). If the teacher had been able to demonstrate to the students the challenge in the problem solving methods, through beginning the lesson with a harder exercise like number 5, then perhaps more students would have seen the personal relevance of the instruction and taken greater cognisance of their engagement in the learning.

In conclusion, this data showed that there was a lack of clarity in the way the teacher described just what the students needed to learn which meant that there was also a lack of clarity with the students. The relevance to the learning was referred to by the teacher as “this is for the Unit Standard you’re working on” but the deeper personal relevance which the teacher knew about was not made explicit to the students. The challenging questions on the worksheet like number 5 could have been an ideal problem to struggle with and establish a learning need with the students. The teacher is aware of the appropriateness of the activities to the Unit Standard, and to the learning needs of the students. The literature around effective and engaged learning states that learners need this clarity too (Black & William, 2006; Harlen, 2006; Stoll, Fink & Earl, 2003). The lack of clarity could be significant to the disengaged students in the video, but the demotivated 38% of the class absent from the lesson suggests a much greater issue with student motivation in this class.

4. The teacher encourages and supports students to self assess against specific criteria for the aspects students are trying to learn

The teacher did not speak to the students about self assessment during the course of the lesson, yet during the video five of the students watched the teacher’s demonstration on the board and then looked at their own attempt in their books, which could be interpreted as a form of self assessment. The information on this strategy was obtained from the

video. Students also disclosed this in the questionnaire in response to the question “how did you check your understanding of that learning?” S4,S5,S13,S17,S19 and S23 all stated that they found out by asking the teacher. Which suggests their desire to know and the teacher’s lack of showing the students how to know for themselves if they were correct in their learning. However, the teacher did not describe anything as criteria for what students were trying to learn.

On a deeper level, the self assessment could have been around notions such as the steps the student took to answer the question or solve the problems. “Perhaps the most salient and exciting product of assessment for learning happens when pupils monitor their own learning and make adjustments by deciding what works and what needs to be revisited” (Stoll, Fink & Earl, 2005, p.69). If students were learning about the problem solving methods they needed for this Unit Standard, as the teacher has suggested they were, although not made clear, then establishing with the students what the problem solving steps were would have been helpful towards the students’ learning. At this deeper level, criteria for problem solving would have provided students with simple strategies to use to help themselves to monitor their own learning.

From the data obtained through the video, interviews and survey, we have a little evidence that the students in this case study monitored their learning when they marked their work according to the teacher’s board demonstration, but we have no evidence of any deeper monitoring than that. Sadler (1998) also argues that self assessment is essential to learning because students can only achieve a learning goal if they understand that goal and can assess what they need to do to reach it. Therefore if this teacher is to increase their students’ chances of improved achievement in NCEA they will find it beneficial to establish learning criteria which the students can routinely assess themselves against.

5. Where there is a gap in student understanding, the teacher encourages students to initiate conversations (with students or teacher) that explore and strengthen that understanding and minimise the gap, - toward the students constructing their own meaning

From the video it was able to be seen clearly when students were initiating conversation that explored and strengthened their understanding about how to solve problems based on graphing questions. As stated earlier, of their 46 student initiated interactions identified from the video, students were talking about their learning 56% of the time. This information

was obtained from the focus group and the keynote interview. There is no evidence in the video that the teacher explicitly encouraged students to work in this way when they were having difficulty with their learning. However, if the teacher did not value these strategies, they could have quite easily told the students to stop talking, or to sit down, or to do their own work, or any of the many behavioural commands that teachers can use. From some students there was evidence in the video of the way they sought support, that their learning was an active dynamic process which is described as advantageous to effective learning by Bishop and Glynn (1999), Black and William (2006), Bruner (1996), Harlen (2006), MOE (2003), and Stoll, Fink and Earl (2005).

This strategy came through strongly in the video, students taking their learning seriously and seeking support when they didn't know what to do. There was evidence that 56% of the student initiated interactions were where the students sought help or needed to check their understanding out with someone else, either another student or the teacher. Hattie (1999) research has shown us that immediate feedback is at the heart of effective learning, so this strategy that the students use is very good for assisting them to learn at their own pace.

In the questionnaire the students also showed that they take action to help themselves learn, six of the students stated that they ask their friends, ask their mate, ask the teacher (S2, S4, S5, S8, S12, S15). However, what of the other students in the class, to be effective learners all students need to be assisted by the learning culture of the classroom to take action to help themselves learn.

I can conclude from this data that 37% of the students wrote about asking their friends or the teacher to help themselves learn. Does this mean that the 63% who didn't state this are not active in assisting themselves to learn? I cannot state this just because of a lack of data. 57% of the student initiated interactions in the video were about seeking assistance with their learning also from a friend or the teacher. I consider 43% of the interactions not being about learning as too high. The purpose of attendance to this class is to learn. 43% of the student initiated interactions not being about learning, but instead about social matters, demonstrates Cowie (2004) who examined how students balance three domains when learning, and social matters take precedence over the remaining two learning focused ones.

6. The teacher encourages reflective dialogues (with students or teacher) about the effectiveness of the learning process as a routine part of the lesson

None of the data was able to provide evidence of this. The capacity for students to review their learning process and their work in light of the goals and criteria are helpful for strengthening meta-cognitive approaches to learning. Alton-Lee (MOE, 2003); Black and Wiliam, (2006), and Harlen (2006) all support the significance of developing meta-cognitive 'thinking about thinking' skills in students for fostering students' self-monitoring and self-regulation strategies. This would be one of the biggest changes in professional practice for this teacher to take, to include strategies in the class lesson to build their students' meta-cognitive skills. Professional support for the teacher would be advantageous to assisting them to make this change.

There was no evidence from the student survey, the focus group interview or the video of the lesson of reflective dialogue. Therefore I cannot say whether they do this or not. The research of Alton-Lee (MOE, 2003) asserts the importance of students developing self-monitoring skills and one of the strategies that strongly contribute to this is meta-cognition. Students did reflect in order to answer the survey and focus group questions, however there was no evidence from the data that was gathered that this sort of thinking process was a regular part of their learning in mathematics.

In conclusion, for students to be effective self-regulating learners the literature has stated that meta-cognition is an important skill to use. The lack of evidence from the way the teacher structured the lesson, showed me that these students were not given any support in the lesson to be meta-cognitive or reflective. The use of this skill would make a difference to student involvement in their learning and is worthy of developing (Black & Wiliam, 2006; Harlen, 2006; MOE, 2003).

In summary, when analysing all the data some 19% of the students appear self regulating, and to be making the most of the opportunity to learn about mathematics through the class lessons. There have been some consistencies between the literature and the data in this study: namely that students do use interaction to clarify their understanding which supports the general tenet of this dissertation. However, this analysis also showed that many students were not effectively self-regulating their learning and therefore their achievement with NCEA would be enhanced if they were. While the students are the learners in this classroom context, it is the way the teacher works with them that will increase or decrease their capacity to be self-regulating. The teacher reflected that she had not altered her

teaching practices through the advent of NCEA, despite research suggesting that the contrary could have been expected (ERO, 2004). Because the teacher hasn't expressed a knowledge of how to establish self-regulating learning with the class this teacher could benefit from professional development in order to do so.

This answers the first objective of this dissertation:

1. to critically analyse the links between the research on assessment for learning and the interactions between the teacher and the students in one lesson in an NCEA class.

It also answers the second objective although this was addressed in greater detail in chapter 4 of this study:

2. to critically examine the presence or absence in an NCEA lesson of student led interactions defined in the literature as learning-focused student interactions that can contribute to self regulated learning.

This dissertation will now embrace the third objective:

3. to identify a set of implications for senior managers of secondary schools regarding the enhancement of the achievement of NCEA students through improving the pedagogy of the teachers.

The literature on effective professional development and effective change management reviewed in chapter 2 will contribute to the identification of these implications for the senior managers of secondary schools.

The literature showed that while NCEA teachers have already received considerable Ministry of Education funded professional development around the new assessments on this qualification, this has primarily been to assist them to understand the technical aspects of the standards-based assessments. Now that NCEA is becoming more established in schools, teachers may be ready to develop classroom based strategies for responding to the standards-based nature of NCEA in terms of embracing the ideas around assessment for learning. For professional development to be effective, it needs to be grounded in a desire to improve students' success with NCEA. Coburn (2003), Stiggins (2002) and Gusky (2002) have all asserted the importance of the entire members of the school community embracing the same vision to raise student achievement through pedagogical change if professional development is to be effective.

There is literature which suggested the types of professional development that make the

biggest difference to teachers, and Hill, Hawk and Taylor (2002) listed a lot of strategies which contribute to professional learning conversations such as modelling, reflection, and the examination of practice. But for the professional development to actually make a difference to the students and to enable them to become self-regulating learners, then it would draw on the current literature base illustrated in this research study around assessment for learning. And for teachers to become familiar with this literature they would need to be provided with professional support so that they could translate them into classroom actions which will support the students to become self-regulating.

For professional development to be effective it needs to be valued by everyone in the school community which would mean making it part of the school's strategic plan and tying it closely to raising student achievement (Cardno,1998). This shared vision would enable the resourcing for the professional development to be strategically planned also (Cardno, 2005; Coburn, 2003; Stiggins, 2002).

### **Implications for senior managers of schools to raise the achievement of their students in NCEA:**

The standards-based assessments provide the potential at least, for 100% of students to achieve in NCEA. This has not happened yet. If student achievement is to improve, then students need to be supported by the researched based teaching practices which make the difference. If teachers are to make these changes then they too need to be supported by school based initiatives that will strengthen their professional reflection and growth. Therefore the following implications are a summarising of the literature to support the raising of student achievement in NCEA:

1. School senior managers and staff to hold a strong desire to raise student achievement in NCEA
  - this desire to be shared by all staff
  - this desire to be shared with students
  - that schools keep this vision strong and uncompromised
  
2. Recognise that schools exist to grow self-regulating learners who will go on learning throughout life.
  - the secondary school teachers raise the profile of the importance of learning in the school

- all teachers in secondary schools to address their professional role in supporting themselves and their students to become self regulating learners
- professional development programmes in secondary schools to be focused on the pedagogy which develops this.
- strategic planning to prioritise this role of the school in growing self-regulating learners, and to fund professional development accordingly

3. A recognition that one of the critical contributors to raising student achievement is the learning-focused partnership between teachers and students.

- this could alter the nature of the classroom interactions so that they are more student led
- that learning programmes would move towards being negotiated between students and teachers to address learning needs
- that students would become more independent and self-regulating as a consequence.

Through powerful secondary school leadership focused on raising student achievement in NCEA, teachers will be given the message that this is possible and that it matters. Through strategically planned and funded professional development initiatives schools will be able to make the change, as long as the initiatives endorse the application of the research based teaching strategies that raise student achievement.

### **Strengths and limitations of this research**

A strength of this small scale descriptive case study was the timeliness of the topic, to raise student achievement with NCEA through focusing on the appropriate pedagogy. Current research from NZQA and the Ministry of Education have signalled this need since this project began.

Another strength of this research was the multiple sources of data which enabled the rich triangulation. Anderson and Arsenault (1997) and Yin (1989) all encourage the importance of multiple data sources to gain as clear a sense of the situation as possible.

Also the appropriateness for descriptive case study research to be collecting in situ data, which was analysed in accordance with the research questions to enlighten the findings from the literature and suggest the need for further research. The chain of evidence is

verifiable from the information in the appendices and the data process described in chapter 4.

The strengths in the ethical design of the research are evident in the consensual participation in the project and that the ethical considerations of student safety were fully adhered to. All participation was informed and voluntary.

Another strength of this research was the depth of the literature review which identified key strategies teachers and students can use to enhance the propensity for effective and meaningful learning to take place. The literature was drawn from all over the world and showed similar messages about the importance of developing self-regulating learners to raise their achievement.

Limitations of the research are around the design.

Firstly the video created a greater student reaction to its known presence than was expected, which reduced the quantity of visual information for the study.

Secondly the smallness of scale for this descriptive case study means few generalisations can be made. Yin (1989) cautions that because descriptive case studies closely examine specific situations, they cannot easily be generalised.

However, this study has shown that one teacher has not made pedagogical changes to adapt to the standards-based assessments in NCEA, and this may suggest that further research could be undertaken to see if this is the case in other schools. What it has also signalled is a way for analysing classroom discourse, which shows how much conversation is about learning and how much is not. This research may signal further research around just what conversations students engage in that really help them with their learning.

### **Recommendations from this research**

If the Ministry of Education is to realise its goal of NCEA promoting life-long learning, helping students to participate in and benefit from further study, acknowledging achievement across a range of learning fields and articulating expectations of learning goals, then it is argued that if this one case study teacher is representative, the pedagogy of the secondary teachers will need to change (MOE, 2004).. Therefore I recommend:

1. That the Ministry of Education funds secondary schools to plan strategically for

professional development in pedagogical practices, namely assessment for learning.

2. That all levels of the education sector, from policy makers right through to classroom teachers, drive the focus of developing life-long learners so as to enable students to gain their qualifications with NCEA.
3. That professional development programmes in secondary schools focus on raising student achievement in NCEA through developing collaborative classrooms that enable dynamic learning-focused relationships to thrive.
4. That New Zealand secondary school teachers embrace their role in supporting students to become self-regulating and successful learners for life through encouraging classroom discussion and learning conversations to thrive.

## **Conclusion**

This small scale descriptive case study has demonstrated that one mathematics teacher in an urban secondary school has not made a pedagogical shift to accommodate the introduction of standards-based assessments in NCEA. This teacher may or may not be representative of NCEA teachers across this country. This study has also described from an analysis of NCEA and the literature, the pedagogy that would support students to thrive with NCEA. This pedagogy in itself could signal for secondary schools, directions to take. This study has also detailed the actions students need to take to maximise their potential for achievement with NCEA. It has demonstrated that students need to actively engage in their learning through learning-focused conversations with their teacher and with each other if they are to become self-regulating life-long learners. Through an analysis of the literature on professional development and change management this study has identified some critical strategies senior managers of secondary schools could take to support their teachers to make this change to their practice. It all really comes back to the vision, the idea of self-regulating learners being the purpose for the shift to standards-based assessment in NCEA. For only if the desire for improvement is strong can enduring change be planned strategically, funded fully and embedded in our education system so that we develop students who are life-long learners and able to make their way successfully in the world.

# APPENDICES

## Appendix A Student questionnaire

### SHIFTING THE PARTNERSHIPS PARADIGM

Student's Name.....

Students' Form Class.....

#### Questions to Students:

1. What were you learning about in the Maths lesson on Tuesday 25 <sup>th</sup> October? whose idea was it?	
2. What did your teacher do to make the standard of that learning clear for you?	
3. How did you check on your understanding of that learning?	
4. How well do you think you are doing in this subject in NCEA this year?- How many credits have you got, is this what you expect to get ?	
5. How do you help yourself to learn about this subject when you are in class?	

## Appendix B Focus Group Questions

### Shifting the Partnerships Paradigm

When Looking at the video	
1. What questions did you ask in class ? Why ? How did it help you with your learning?	
2. Who did you talk to in class about your learning? Why ? How did it help you with your learning?	
3. Who talked to you in class about their learning? Why ? How did you help them with their learning?	
4. What helps you to learn? What choices do you get given about what to learn?	

## Appendix C Teacher Questions

### Shifting the Partnerships Paradigm

1. <i>What were the students learning about in that lesson? Whose idea was it that they learn that?</i>
2. <i>How did you or What did you use to make the standard of that learning clear for them?</i>
3. <i>What opportunities did you make available to students so that they could talk with each other or with you to clarify their understanding?</i>
4. <i>How do students know how well they understood that lesson?</i>
5. <i>What will they do about that understanding?</i>
6. <i>What do you do in class to assist students specifically with their NCEA?</i>
7. <i>Have you changed your teaching practice / pedagogy as a result of NCEA ? Has this made any difference to student learning?</i>
8. <i>Thinking about NCEA, what are you doing in class to specifically assist them with NCEA?</i>
9. <i>In the video what were the practices that reflect that approach?</i>

## Appendix D Interaction Analysis

Interaction Times during the course of the 50 min lesson	student to student	student to teacher	teacher to student	teacher to class
	S 1			
03:00:00				L 1
	S 2			
05:32:00				B 2
	S 3			
	S 4			
			B 1	
07:29:00				B 3
	S 5			
		L 1		
			B 2	
08:40:00				B4
		M 2		
	S 6			
10:40:00		L 3		
	S 7			
11:30:00		L 4		
11:56:00				L 5
		L 5		
		L6		
		L7		
	S 8			
17:24:00		L 8		
	S 9			
19:43:00			B 3	
19:45:00			B 4	
19:47:00			B 5	
19:54:00			B 6	
		L 9		
	S 10			
20:46:00	L 11			
20:53:00	L 12			
21:04:00	L 13			
21:17:00		L 10		
21:42:00				L6
22:17:00				L7
26:48:00	S 14			
	S 15			
30:35:00	S 16			
			B 7	
	S 17			
32:37:00				L 8
			B 8	
32:55:00				L 9
	S 18			
		L 11		

Interaction content CODE			
B behaviour			
S social			
L learning			
M material			

Class settle down you need to read it and think about it

	L 19			
	L 20			
	S 21			
		L 12		
36:03:00			B 9	
	L 22			
	S 23			
36:58:00	L 24			
	S 25			
	S 26			
40:39:00	L 27			
			L 10	
	L 28			
			L11	
		L 13		
43:54:00				B 10
44:25:00				L 11
45:11:00				L 12
	S 29			
47:25:00			B 12	
	L 30			
	L 31			
		L 14		
51:20:00			B 13	
	S 32			
52:20:00				L 13
		B 15		

Do you do it like this? How did you do that?  
How did you get that?

Q 4 is likely to be in your  
test

If you are getting these answers  
you are understanding this graph really well

***Appendix E Worksheet sample used by students***











## **Appendix F Data Gathering Process**

### **Data gathering process:**

1. Meet with Principal to explore the possibility of conducting the research in the school. establish guidelines for consent
2. Meet with Principal to obtain Principal's consent, Board consent and community consent.
3. Meet with Principal to ascertain the research data gathering process
4. Meet with teacher to explain research proposal and seek consent
5. Meet with students to explain research proposal and consent process
6. Meet trusted adult ie Counsellor and arrange for interviews on 28<sup>th</sup> October
7. Teacher to encourage students to return consent forms – any incentive ?
8. IT teacher to set up video tapes and camera for each videoed maths lesson for the research
9. Wednesday 19<sup>th</sup> – Wednesday 26<sup>th</sup> October, Y11 Maths lessons videoed- once all consent forms have been returned. I suggest setting a camera up on a tripod in one part of the room. Students who do not give their consent are to be seated out of camera range
10. Judy Munro-Keene to meet trusted adult to prepare for Friday 28<sup>th</sup> October
11. At end of the videoing (On afternoon of Wednesday 26<sup>th</sup>) teacher selects the day in which the student interaction is most typical or normal for their lesson.
12. Whilst on Bus Duty at 8am on Thursday 27<sup>th</sup> October, teacher to give Judy Munro-Keene the signed consent forms and video tape of the lesson, which will be used for the analysis
13. This tape will be the one to be transcribed and used for the analysis.
14. Students in the Y11 Maths class to be interviewed by Judy Munro-Keene on Friday 28<sup>th</sup> October to interpret their interaction in videoed and transcribed lesson . Trusted adult and Judy Munro-Keene co-construct interview guidelines to ensure that students respond in a manner that maintains the safety of all research participants.
15. An interview time with the teacher to be made for interpretation of the videoed and transcribed lesson period 5 on Friday 28<sup>th</sup> October
16. Researcher to supply transcripts of lesson and interviews for checking to both teacher and students Wednesday 2<sup>nd</sup> Nov
17. All research participants to read the transcripts and sign them if they are correct and happy to have them used.
18. Transcripts to be delivered to researcher by end of week.
19. Letters of thanks sent to Principals, Board, Community leaders, School Counsellor, Teacher and students.

### **The Case Study Chain of Evidence contains:**

Focus group: Student interview questions  
Key informant Teacher interview questions  
Student responses to surveys  
Interaction analysis  
Data gathering process

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