



<http://researchspace.auckland.ac.nz>

ResearchSpace@Auckland

Copyright Statement

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

This thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of this thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from their thesis.

To request permissions please use the Feedback form on our webpage.

<http://researchspace.auckland.ac.nz/feedback>

General copyright and disclaimer

In addition to the above conditions, authors give their consent for the digital copy of their work to be used subject to the conditions specified on the [Library Thesis Consent Form](#) and [Deposit Licence](#).

Note : Masters Theses

The digital copy of a masters thesis is as submitted for examination and contains no corrections. The print copy, usually available in the University Library, may contain corrections made by hand, which have been requested by the supervisor.

The Effects of Principal Instructional Leadership on Secondary School Performance

Linda Bendikson

A thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy in Education, The University of Auckland, 2011.

Abstract

The aims of this research were to develop a system to assess the relative performance of secondary schools in order to compare the nature and impact of principals' instructional leadership in more and less effective schools. Study 1 developed a multi-indicator method for assessing the relative performance of 102 New Zealand secondary schools, using publicly available examination data. Five indicators were used to categorise schools of similar type as either higher-, mid-, or lower-performing and to identify schools that showed sustained improvement in performance. In Study 2, 651 teachers in 29 schools completed surveys about school culture and the principal's leadership. Principals' instructional leadership and school cultural indicators were then categorised as either *direct* or *indirect*, and their impact on performance levels investigated.

Six major findings emerged. First, improving schools tended to be located in low or middle socio-economic (SES) communities and were more often those already mid- or higher-performing. Second, the best predictor of whether a school was categorised as improving was a principal's previous leadership experience as a deputy principal or principal, whereas a principal's length of tenure in a school was the best predictor of a school being categorised as higher-performing. Third, principal leadership factors explained up to 20% of the variance in school performance. Fourth, different types of instructional leadership predicted school improvement and performance. While school performance was predicted by indirect instructional leadership, only the direct leadership behaviours had significant effects in improving schools. Fifth, structural models indicated that while principal instructional leadership was mediated by the culture of the school, it had a stronger direct impact on school performance. Sixth, principals in improving schools had an indirect effect on school performance via a strong managerial infrastructure (indirect culture) while principals in higher-performing schools had an indirect effect via a strong teaching and curriculum infrastructure (direct culture). Further research into systems and management practices is suggested as the possible main mediator of principal instructional leadership in secondary schools.

Acknowledgements

The genesis of this research was work related. It started with an examination of the gross levels of performance of secondary schools as indicated by their percentage of passes in NCEA. These data were mapped onto the deciles of the schools, and the pattern that was revealed caused numerous questions to be asked. The person who gathered this data into a dataset was Lorelei King-Salisbury. Lorelei is a very talented person without whose analytical skills this project may never have started.

Certainly, none of this research would have been possible without the co-operation of the 29 principals and 651 teachers who bothered to send back questionnaires. To all of these generous souls, I am most indebted, but in particular, I thank the principals. It is no small thing to allow your teachers to rate your leadership behaviours and to have these ratings associated with a theoretical view of the performance level of the school.

It is my supervisors at The University of Auckland, however, who have provided unstinting support and guidance throughout this time. I purposely sought out the supervision of Viviane Robinson as the principal author of the Best Evidence Synthesis on School Leadership and Student Outcomes (Robinson, Hohepa, & Lloyd, 2009). I had an idea about matching leadership behaviours to school performance, and no more than that at the time of my approach to her in 2008. She responded enthusiastically and suggested that the idea for the research may also be of interest to John Hattie.

With typical efficiency, when I arranged to meet Viviane some months later to progress the idea of this research, she had organised for John to be present at the meeting. John gave me a 'grilling' about why I would want to do a PhD, who I admired in international educational research, and whether I could write. He sent me off with a list of tasks to achieve and provided a three page overview of his expectations of PhD students. I recommend this latter technique to anyone considering supervision. The expectations were clear and unambiguous and acted as the guide to our way of working together.

The mix of these two supervisors has been critical to the success of this period of study. I have enjoyed it largely because I have been lucky enough to have two supervisors with different strengths: one in measurement and the other in educational leadership theory and research. Two more different but

complementary people you could not find. Others have also contributed formally; Andrew Lavery proofread the final version of this thesis and Heidi Leeson peer reviewed chapters four and five prior to submission. My thanks go to them both. Cathy Wylie also read my final draft and contributed valuable feedback. Her support and encouragement throughout the years of study have been appreciated.

I also owe a debt of gratitude to my managers at the Ministry of Education, particularly Kathy Phillips, who supported my desire to pursue this research. This support has been continued by my current employer, UniServices. I am grateful to both organisations for the value they put on higher learning.

Ann Moore, my long-time friend and employee at The University of Auckland provided both practical and emotional support throughout my studies. She introduced me to Viviane in the first place—an act that led to my enrolment as a student much earlier than I had planned. Her encouragement has been bountiful. When I had no idea of what my next career move would be, and how my research might contribute to it, she was adamant that “doors will open” because of this work. She was right.

My father has also offered unstinting support throughout. He has always conveyed his confidence in me to complete this task, and his pride in my accomplishments. Also my brothers and their families have shown understanding when I have failed to turn up to family events because “I am on a timeline and every day is precious”.

Finally, my heartfelt thanks go to Paul, my beloved partner of 34 years. For more than three years he has done all the housework, all the shopping, all the gardening, and put up with a preoccupied and busy partner who was frequently away from home working for the Ministry, and when I was at home, was working on this research. This research is dedicated to him.

Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
Table of Contents.....	v
List of Tables.....	ix
List of Figures.....	x
Chapter 1: Introduction.....	1
The Educational Problem.....	4
The Principal in the New Zealand Context.....	5
The Role of the Secondary Principal in School Performance.....	7
School Culture.....	8
Research Design.....	9
Thesis Organisation.....	11
Conclusion.....	11
Chapter 2: Assessing School Performance—Study 1.....	12
The National Certificates of Educational Achievement.....	12
Using NCEA Results as Indicators of School Performance.....	16
Using NCEA Results as Indicators of Improvement.....	19
Methods of Assessing and Comparing School Performance.....	20
Gross Productivity.....	20
Value-added Modelling.....	21
Regression Discontinuity.....	22
Growth Curve Analysis.....	22
Multilevel Modelling.....	23
Schools of Similar Type.....	23
Assessing Relative Performance.....	25

Assessing Improvement	27
Developing a New Zealand Model for Identifying Relative Academic Performance.....	31
Sample.....	31
Indicators for Assessing Relative Performance.....	32
Indicators for Assessing Improvement	35
Cross Check of the Categorisation	37
Results.....	41
All schools	41
Sample schools (<i>N</i> = 30).....	42
Improving Schools.....	43
Discussion.....	45
Conclusion.....	50
Chapter 3: Principal Instructional Leadership in Secondary Schools— Literature Review.....	52
The Theoretical Framework.....	54
School Culture.....	56
How do Secondary Principals Enact their Instructional Leadership?	59
Descriptions of Secondary School Principal Leadership	63
Primary and Secondary School Comparisons	65
How Much Impact do Secondary School Principals have on School Performance?.....	67
Culture.....	72
Direct Instructional Leadership.....	74
Indirect Instructional Leadership	76
Antecedent Effects on Principal Instructional Leadership.....	78
How Can Secondary School Principals Improve School Performance?	83
Decision Making.....	85
Strategic Resourcing: Staff Appointments	88

Strategic Resourcing: Resource Allocation	89
Ensuring an Orderly Environment.....	90
Problem Solving	92
Establishing Academic Goals and Expectations	94
Promoting and Participating in Professional Development.....	95
Monitoring and Coordinating Teaching and the Curriculum	97
Developing a Sense of Collective Responsibility	99
Conclusion.....	99
Chapter 4: Developing a Measurement Tool for Instructional Leadership in Secondary Schools	102
Measuring Instructional Leadership	103
Creating a Teacher Survey of Instructional Leadership and Culture	106
Construction of the Questionnaire	108
Evaluation of Model Fit.....	117
Evaluation of the Factorial Structure of the Principal Instructional Leadership and Culture Questionnaire	119
Conclusion.....	121
Chapter 5: Assessing Principal Instructional Leadership in Secondary Schools—Study 2.....	123
Method	124
Participant Characteristics	124
Measures and Covariates.....	126
Results.....	128
Discussion.....	159
Limitations.....	159
Principal Effects.....	160
Cultural Effects.....	166
Conclusion.....	167

Chapter 6: Discussion and Conclusions.....	169
Limitations of this Research.....	170
Measuring School Performance.....	171
Importance of Principal Leadership Experience	172
Direct and Indirect Instructional Leadership	175
The False Leadership-Management Dichotomy	179
Culture as a Moderator of Principal Instructional Leadership.....	179
Applications of Research.....	182
Time for both a System and a Strategy.....	183
Principal Recruitment and Development: First Steps to Change?.....	185
Future Research	186
Conclusion.....	187
Appendices.....	190
Appendix A: Overview of Schools’ Performance Rankings	190
Appendix B: Teacher Questionnaire	192
Appendix C: Questionnaire Items by Dimension	199
Appendix D: Correlations of Dimensions	202
Appendix E: Letter to Principals.....	203
Appendix F: Questionnaire for Principals	206
Appendix G: Effect Size Results of Principal Instructional Leadership Compared to that of Robinson et al. (2008)	207
Appendix H: Effect Size Results of Cultural Dimensions	208
References	209

List of Tables

Table 1 Schools by Decile Group.....	32
Table 2 Results of a Sample of Schools to Illustrate the Method of Categorisation	37
Table 3 Higher-, Mid-, and Lower-Performing Schools by Method 2 (Numerical Aggregation) with any Differing Results from the Rules Method in Brackets.....	38
Table 4 Performance Levels of Schools by Decile Band (N = 102)	42
Table 5 Improving Schools by Performance Levels and Decile Band (N = 102)	42
Table 6 School Performance by Decile Band (N = 30).....	43
Table 7 Number of Improving Schools by Decile Band	44
Table 8 Sample Schools' Final Categorisation by the Rules Method	44
Table 9 Strong Primary and Secondary Principal Behaviours (Smith & Andrews, 1989).....	66
Table 10 Quantitative Studies of the Effect of Principal Leadership on Secondary Student Outcomes	69
Table 11 Summary of Instructional Leadership Dimensions of Hallinger and Murphy (1985) and Murphy (1990).....	103
Table 12 Summary of Heck, Marcoulides, and Lang's (1991) Instructional Leadership Dimensions	104
Table 13 Summary of Heck's (2000) Cultural Dimensions	105
Table 14 Summary of Alig-Mielcarek and Hoy's (2005) Instructional Leadership Dimensions	105
Table 15 Dimensions for the Principal Instructional Leadership and Culture Questionnaire	107
Table 16 Direct and Indirect Dimensions	110
Table 17 Items by Dimensions	112
Table 18 Cronbach Alpha Scores for Dimensions	113
Table 19 Fit Indices for Structural Models to the Principal and Cultural Dimensions	120
Table 20 Decile of Sample Schools versus Population.....	125
Table 21 Performance of Sample Schools versus Population.....	125
Table 22 Means of Principal Dimensions (N = 651)	128
Table 23 Means of Principal Dimensions (N = 29)	129
Table 24 Items with the Largest Differences between Schools of Varying Performance Levels.....	134
Table 25 Items with the Smallest Differences between Schools of Varying Performance Levels.....	135
Table 26 Effect Sizes of Cultural Dimensions in Higher- and Mid-performing Schools	137
Table 27 Effect Sizes of Cultural Dimensions in Higher- and Lower-performing Schools.....	137
Table 28 Effect Sizes of Principal Dimensions in Higher- and Mid-performing Schools	138
Table 29 Effect Sizes of Principal Dimensions in Higher- and Lower-performing Schools	139

Table 30 Largest Effect Sizes for Principal Instructional Leadership.....	139
Table 31 Largest Effect Sizes for Cultural Dimensions.....	140
Table 32 Effect Sizes of Cultural Dimensions for Improving Schools and Others.....	143
Table 33 Items with the Greatest Differences between Improving Schools and Others	144
Table 34 Items with Least Differences between Improving Schools and Others	146
Table 35 Effect Sizes of Principal Dimensions for Improving Schools and Others.....	147
Table 36 Principal and Cultural Effects for Improving Schools and Others	147
Table 37 Beta Weightings of Teacher, Community, and Principal Variables.....	153
Table 38 Predictors of Higher Performance	156
Table 39 Model Summary of Four Step Regression on School Performance (Performance Rating).....	157
Table 40 Predictors of Improving School Status	157
Table 41 Model Summary of Four Step Regression on Improving School Status.....	158

List of Figures

Figure 1 NCEA Level 1 Percentage of Passes by Decile for a Sample of Schools	33
Figure 2 Theoretical Framework for Conceptualising Principal Instructional Leadership.....	55
Figure 3 Principals’ Sources of Power to Influence School Culture and Performance	85
Figure 4 First-Order CFA Model of Scores from the Cultural Dimensions.....	115
Figure 5 First-Order CFA Model of Scores from the Principal Dimensions.....	117
Figure 6 Percentage of Teachers Reporting Leadership Activity by Role ($N = 651$)	130
Figure 7 Mean Scores of Principal Dimensions by Performance Rating ($N = 651$)	132
Figure 8 Mean Scores of Principal Dimensions by Performance Rating ($N = 29$)	132
Figure 9 Mean Scores of Cultural Dimensions by Performance Rating ($N = 29$)	133
Figure 10 Mean Scores of Principal Dimensions of <i>Improving School</i> and <i>Others</i> ($N = 651$)	141
Figure 11 Mean Scores of Principal Dimensions for <i>Improving Schools</i> and <i>Others</i> ($N = 29$)	141
Figure 12 Mean Scores of Cultural Dimensions of <i>Improving Schools</i> and <i>Others</i> ($N = 651$)	142
Figure 13 Mean Scores of Cultural Dimensions of <i>Improving Schools</i> and <i>Others</i> ($N = 29$)	142
Figure 14 Structural Model for School Performance (Performance Rating)	149
Figure 15 Structural Model for <i>Improving Schools</i>	152
Figure 16 Structural Model for Teacher, Principal, and Community Factors.	155
Figure 17 The Principal’s Power to Influence School Performance	176
Figure 18 Revised Theoretical Framework for Conceptualising Principal Instructional Leadership	182

Chapter 1: Introduction

A lot of emphasis is currently placed on the need for principals to be instructional leaders. They are no longer expected to be merely 'head teachers' who manage some administrative responsibilities and ensure that students are fit for some predestined, class-defined role as they were for much of the 20th century. It is now accepted that principals have a key role in ensuring that all students achieve at common nationally determined standards. Multiple pressures have brought about this change—largely economic and political (Organisation for Economic Co-operation and Development, 2008).

Effective schools research has also contributed to this expectation. An increased understanding that schools can and do impact on student outcomes, has led to a parallel increased expectation that principals have a key leadership role in helping teachers to increase their influence over these outcomes (Good & Brophy, 1986; Hallinger & Heck, 1998; Organisation for Economic Co-operation and Development, 2008). The conclusion that is now widely accepted, is that the more focused the principal is on instruction, the more effective the school will be in adding value to student outcomes (Robinson, Lloyd, & Rowe, 2008).

A focus on the quality of instruction is the essence of what is meant by the term *instructional leadership*. For example, the OECD (2008) referred to roles such as coaching and mentoring of teachers, organising professional development, and monitoring teacher practices as instructional leadership. Alig-Mielcarek and Hoy (2005), similarly concluded that defining and communicating goals, monitoring and evaluating teacher practice, and organising professional development were the core features of instructional leadership. Throughout this thesis I refer to these types of behaviours as *direct instructional leadership*.

In this thesis I argue that instructional leadership is commonly defined too narrowly; it is a term that has often come to mean just those behaviours that I have called *direct*, because they quite directly impact on teaching. We need to have a broader understanding of what instructional leadership is in order to understand how principals exercise influence over the quality of teaching, and therefore the performance of the school as measured by student outcomes. Much of this influence can be attributed to effective *management* of a school with a clear focus on improving academic outcomes. I argue that

indirect instructional leadership involves behaviours that are largely thought of as managerial, but in the literature review of Chapter 3 I develop the argument that many managerial behaviours, if they have a strong academic goal focus, are examples of instructional leadership, albeit, indirect. By defining instructional leadership as only or mainly the behaviours that directly impact on teachers, principals are being given the message that other behaviours do not affect school performance. This is not the case as will be shown in more detail in the literature review of Chapter 3 and the results of Study 2 in Chapter 5.

In Chapter 4, I describe the development of the survey that was used in Study 2 to measure instructional leadership and argue that, historically, a focus on *academic press*, or a strong academic goal focus, has typically been viewed as core to the concept of instructional leadership. As was the case in the two brief examples referred to earlier, an emphasis on monitoring and influencing teaching practices and student outcomes is the second dimension that is almost always cited as part of instructional leadership. The third dimension that is usually inherent in any concept of instructional leadership is the ability to develop a culture conducive to improving learning. But, while the emphasis on the need for principals to be highly focused on academic goals and to attend closely to the effectiveness of classroom practices is not debated here, I conclude that too little emphasis is being given to how a principal contributes to developing such a culture. I argue over the course of the thesis that this involves good decision making, problem solving, and attention to systems and procedures. For this reason, I refer to some of these practices as *indirect instructional leadership* and attempt to assess the impact these behaviours can have.

Indirect instructional leadership supports the development of an effective school culture by impacting on how well the school is organised and managed. For example, it is commonly accepted that maintaining an orderly environment is important so that effective teaching may occur (Chenoweth, 2007; Dinham, 2005; Louis & Miles, 1991; Rossmiller, 1992; Rutter, Maughan, Mortimore, & Ouston, 1979). Other research indicates that attempting to resolve teacher problems is an important feature of effective principalship (Cheng, 1991; Dinham, 2005; Heck, 1993; Louis & Miles, 1991; Rossmiller, 1992). Resourcing strategically both in terms of human and material resources has also been shown to be effective in gaining positive outcomes in schools (Dinham, 2005; Firestone & Rosenblum, 1988; Little, 2002; Rossmiller, 1992). However, these behaviours are frequently not cited as examples of instructional

leadership or are conceptualised as minor sub-dimensions worthy of only one or two items under a broader dimensional heading.

In conversations, these behaviours are often dismissed as *managerial* with the clear implication that they are not the prime concern of effective instructional leaders, and are not to be equated with leadership or instructional leadership. In some cases, this stance may be attributed to the interpretation of the meta-analytical findings of Robinson, Lloyd, and Rowe (2008). This research indicated that leadership behaviours that were more closely focused on the classroom had larger effects than others. Robinson and colleagues (2008) found from their meta-analysis of 12 studies linking leadership to outcomes, that the school leader's role in *Promoting and participating in teacher learning and development* had an average effect size of 0.84—a large effect, and *Planning, coordinating, and evaluating teaching and the curriculum* and *Establishing goals and expectations* both had moderately large effects of 0.42 on outcomes. All three dimensions would be considered direct instructional leadership as defined in this thesis. Robinson and colleagues also estimated effects of what can be termed as two indirect dimensions. They found smaller but still important effects for *Resourcing strategically* (0.31) and *Ensuring an orderly and supportive environment* (0.27). Thus, one conclusion from this study was that the closer the leader is to teaching and curriculum matters, the greater the effects. The impact of the indirect or more managerial behaviours, while not as strong as the direct instructional leadership behaviours, was still important, yet little subsequent attention has been given to the need for these behaviours. Instead, the need for the principal to be directly involved in instruction has been emphasised. I argue the degree and nature of that involvement will vary according to the context in which a leader works.

Instructional leadership needs to be understood as a range of behaviours that impact on instruction. The tendency to think of instructional leadership only as those behaviours that are directly affecting teaching and learning could potentially have detrimental effects. For instance, how effective would principals be if they focused solely on the quality of instruction and ignored such issues as wide-scale truancy or fighting in the school grounds? Or, could a school be effective if it did not utilise good systems and processes to monitor student achievement? A principal has to ensure that the systems and procedures are in place to support teaching and learning.

Principals need to focus on the quality of instruction, but this cannot be considered in isolation of so-called managerial functions that I will argue, are the bedrock of instructional leadership. Consequently, in this thesis, instructional leadership is conceptualised as both *direct* and *indirect* behaviours, but the emphasis on *academic press* or the press for the achievement of all students is the defining factor in all instructional leadership dimensions.

I am not suggesting that all management behaviours are indirect instructional leadership. Some managerial functions may be no more than acts that maintain an unsatisfactory status quo. They may actually impede teachers' instructional practice such as when meetings are lengthy and focused on bureaucratic controls that do nothing to improve instruction or student learning. The effective principal, I will argue (in Chapter 3), manages the environment to optimise learning (indirect instructional leadership), and provides guidance and support for other school leaders or teachers to improve the quality of instruction and the achievement of all students (direct instructional leadership).

The emphasis on the achievement of *all* students is an important part of my concept of instructional leadership, but so is the nature by which this is achieved. For example, instructional leadership is focused on improving student outcomes, but an attempt to improve outcomes by 'picking and choosing' students to raise apparent achievement levels cannot be considered instructional leadership. Similarly, manipulating academic results by denying some students the right to sit examinations is the antithesis of instructional leadership as the term is defined in this thesis. Ethical leadership that is focused on gaining more equitable outcomes for all students is inherent in the concept of instructional leadership.

The Educational Problem

The expectation that principals will improve educational outcomes and be instructional leaders has increased with the transparency that has resulted from international assessments, and the growing concern about developing 'knowledge economies' to meet the challenges of the 21st century.

International assessments such as the Programme for International Student Assessment (PISA) (Telford & May, 2010) and the Trends in International Mathematics and Science Study (TIMSS) (Caygill, Lang, & Cowles, 2010) have highlighted the comparative performance of school systems over the last 15 years. These assessments have created pressure on nations (and therefore schools and their principals) to

improve outcomes (Organisation for Economic Co-operation and Development, 2008). In a sense, these assessments have become international league tables. Governments are rightly interested in how their education systems perform in comparison with others. This increasing tendency to measure educational performance has inevitably led to more questions being asked about the adequacy of both levels of achievement, and the rate of progress in improving outcomes, and along with it, the effectiveness of school leadership. Principals are under increasing pressure to perform. This is perhaps true of secondary school principals more than primary school principals in New Zealand, because the percentage pass rates in secondary school national qualifications are published in newspapers.

In New Zealand, the latest results from the 2009 PISA survey (Telford & May, 2010) indicated that after three cycles of these tests, New Zealand 15 year olds continue to have high average results, but results are largely stable (rather than improving) and huge inequities are evident. About a quarter of Māori and a third of Pasifika students are represented in the lowest attainment levels, and there is no sign of any improvement over the nine years that these tests have been administered. Given that the proportion of Māori and Pasifika students in schools is increasing and likely to continue to do so, the problem cannot be ignored. Yet, the inequities have endured despite the clear policy intent of successive governments to address the disparity.

The Principal in the New Zealand Context

In New Zealand's case, some educational commentators hold the view that, to some extent, the lack of improvement in the results of international assessments can be attributed to the nature of the self-managing education system (Bates, 2009; Bendall, 2009; Hattie, 2009a; Wylie, 2009). Because the management of the New Zealand system is almost completely devolved to the school level, the principal, they argue, is torn between competing priorities. Schools are urged by the Ministry of Education to focus on raising the achievement of all students, particularly those of Māori and Pasifika origin who are not performing at the level of other New Zealanders. However, because each school is essentially in competition with its neighbouring schools for students, and in turn the number of students determines the size of the principal's salary, principals are not necessarily motivated to address the underachievement problem. They may be more concerned with growing their rolls (and therefore their salary) and attracting students who are 'easy to teach' in order to enhance the reputation of their

school. Thus, the New Zealand system is not well placed to encourage the ethical leadership that underpins instructional leadership's focus on improving outcomes for *all*. In the concluding chapter of this thesis, I return to this point, and like other commentators in New Zealand, suggest that system changes are required to enhance the instructional leadership of principals.

New Zealand schools are also isolated by their competitiveness for students so they may be reluctant to share issues and problem solve with other schools, yet it is now broadly accepted that schools need to be collaborating and building collective knowledge to improve performance (Fullan, 2006a; Fullan, Bertani, & Quinn, 2004; Newmann & Wehlage, 1995). Competition and isolation tend to lead to narrow goals of increasing the numbers of students, as opposed to improving the quality of learning and outcomes for all students. This *school-centredness* rather than *system-centredness* is a result of the level of devolution that has occurred in New Zealand. So, in summary, while on the one hand there is pressure for principals to be instructional leaders and to gain better results for all students on the part of government, on the other hand there is a strong motivational force that may undermine instructional leadership as principals concern themselves with maintaining a positive school reputation.

Another factor that is pertinent to the arguments that follow within this thesis is the workload of the principal. It has been acknowledged for many years that principals do not spend much time on instructional matters (e.g., Good & Brophy, 1986), but in New Zealand's highly devolved system, some evidence suggests this effect is exacerbated (Chamberlain, 2006). While it is unlikely that any principal or school governance board would give up the autonomy they have enjoyed for more than 20 years of the so-called "Tomorrow's Schools" (Lange, 1988), where school governance was devolved to local communities, it means that the principal has a very broad set of responsibilities. By necessity, the principal must, as the Chief Executive Officer (CEO) of the board, maintain close oversight of property, finances, personnel, and teaching and learning. As such, a highly managerial focus is a requirement of the role that can neither be ignored nor underestimated.

New Zealand principals, as in many other countries, are more likely to be involved with administration and management of the learning environment than with directing activities within the classroom (Caygill, et al., 2010; Hipkins, 2004). Therefore, the reality for most principals is that they are likely to

spend the majority of their time on indirect instructional leadership, and a minority on direct instructional leadership. How effective these indirect behaviours are, then, is of considerable importance.

The Role of the Secondary Principal in School Performance

A complicating factor in the study of instructional leadership in secondary schools is that the majority of such research has been carried out in primary schools. Some researchers have warned against generalising these results to secondary schools (e.g., Bossert, Dwyer, Rowan, & Lee, 1982; Firestone & Herriott, 1982; Hallinger & Murphy, 1987; Leithwood, 1994), because secondary schools have less goal consensus (Herriott & Firestone, 1984) due to the size and departmentalisation of learning areas (Sammons, Thomas, & Mortimore, 1997; Siskin, 1994). Their teachers tend to be specialists led instructionally by heads of departments (Siskin, 1994). As such, secondary principals use less direct instructional leadership than their primary school equivalents, who lead a team of generalists joined by a common interest in teaching 'the basics' (Heck, 1992; Smith & Andrews, 1989). For example, a secondary principal is unlikely to have a lead role in observing teachers in the classroom, or provide feedback on teaching practice. Both of these behaviours are part of the dimension that emphasises teaching and curriculum, and are almost invariably cited as core to instructional leadership along with goal orientation and developing a positive school culture. Consequently, if the direct instructional leadership of secondary principals was measured by such a dimension, we could expect effects to be less than that of primary school principals in smaller schools who might be expected to carry out more of these behaviours themselves. Care needs to be taken therefore, that when measuring instructional leadership, items are appropriate for the secondary school context.

Evidence detailed in Chapter 3, indicates that secondary principals play a significant role in ensuring that teachers can teach and students can learn by indirect behaviours: minimising distractions for teachers, establishing sound routines, developing consistent practices across departments, and having a problem-solving approach to issues that arise on a day-to-day basis (e.g., Firestone & Rosenblum, 1988; Louis & Miles, 1990, 1991; Rutter, et al., 1979). If these behaviours are focused on improving student outcomes, they are instructional leadership, albeit, indirect. The size of most secondary schools and the age and learning needs of students require a secondary principal to have a strong focus on maintaining a stable and engaging learning environment. The more time teachers and students are 'on task', the more likely

learning is to improve (Good & Brophy, 1986; Louis & Miles, 1991; Rutter, et al., 1979). Thus, indirect instructional leadership is a key tool for secondary principals that may be underestimated or missed altogether by some instruments that measure instructional leadership if that concept is defined as direct behaviours only.

Furthermore, such a narrow definition of instructional leadership is likely to place undue pressure on secondary principals to carry out direct instructional leadership, when that may not be a reasonable or manageable expectation. Secondary principals, like all principals, need to assess their own school's challenges and strengths, and carefully determine what their role needs to be to improve outcomes. Some situations may demand a strong direct instructional leadership focus such as when there is a dearth of such expertise at the deputy principal or head of department level. In other situations, a principal may need to focus on establishing good systems and procedures, or developing better relationships with the community in order to improve outcomes.

School Culture

Principals, like other leaders have to adapt to the conditions they find themselves in. These conditions are sometimes referred to as school culture—the cumulative effects of both the external environment (e.g., socio-economic status of the community, level of transience of students) and internal environment (e.g., skills and attitudes of teachers and students). Like the notion of instructional leadership itself, culture is conceptualised and measured in a variety of ways, but is frequently viewed as the mediator of principals' instructional leadership. Thus, principal instructional leadership is commonly conceptualised as impacting via the culture of the school (e.g., Louis & Miles, 1990; Marcoulides & Heck, 1993). Culture is revealed by the artefacts (e.g., how people dress, what routines are followed), values (e.g., opinions expressed about the level of commitment to students), and underlying assumptions (e.g., opinions that may not be expressed such as beliefs about the innate ability of students) of an organisation (Schein, 2004). Schools in decline can suffer from vicious cycles of low expectations and low performance (Firestone & Rosenblum, 1988), whereas effective schools are generally depicted as having teachers with high expectations and levels of commitment. Because culture is a mediator of principal instructional leadership, the behaviours and attitudes of staff are important to assess as an indicator of school culture when estimating the impact of principals.

A key argument developed throughout the thesis is that secondary principals need to be responsive to their particular environment. If the school is performing poorly, a more direct form of instructional leadership may be required to gain improvement than if the school is already performing highly (Blank, 1987; Hoy, Hannum, & Tschannen-Moran, 1998; Louis & Wahlstrom, 2011). Much may depend on the current level of a school's performance and the challenges that are being faced. Schools, like all organisations, evolve and go through different phases in development. Leaders have to adapt to these to be effective (Hallinger & Murphy, 1987).

Research Design

The purpose of this research is to establish links between the levels of school performance and the instructional leadership behaviours of principals in secondary schools. The research framework utilised in this thesis assumes that the person with the positional power in the school (the principal), needs to influence the culture of the school (the staff's practices, attitudes, and beliefs) in a goal oriented way to either improve performance or maintain high levels of performance. How they impact on performance is the focus of this research. The major hypothesis that is tested in this thesis is as follows:

Secondary principals exert much of their influence via indirect instructional leadership and this is an effective means of impacting on school performance.

It is argued that a principal does not necessarily have to take a direct instructional leadership role such as leading the professional development or actively observing teachers in the classroom. Yet, a lot of pressure may come on secondary principals to take this type of direct instructional leadership role due to the reporting of its effectiveness, regardless of the fact that much research has focused on primary schools rather than secondary schools, and frequently used measures of 'leadership' in general as opposed to 'principal leadership' (e.g., Robinson, et al., 2008). As a result, very little is known about the type of instructional leadership secondary principals use or what impact they have.

But judging the performance levels of schools so that principal effectiveness can be assessed is not a simple matter. How do you compare schools that deal with totally different clientele? It is obviously not

fair to compare the results of a school in a very high socio-economic status (SES) area with one from a very low SES area. Six different methods that can be used to compare school performance are described in Chapter 2, most of which attempt to assess the value that schools can add. I describe and justify a schools-of-similar-type method to assess the comparative performance of secondary schools in New Zealand. In summary, the key questions that guide this research are:

How can the performance of secondary schools be reliably categorised? (Study 1)

Are there patterns in the instructional leadership practices of schools that have been identified as effective? How can differences in performance between schools that perform above and below the average for schools of a similar type be explained, and to what extent does the instructional leadership of the principal contribute to these outcomes? (Study 2)

Thus, this thesis is comprised of two separate studies. Study 1 describes how publicly available student achievement data (National Certificates of Educational Achievement—NCEA) are used to categorise schools by performance levels. A method of aggregating different indicators by the use of rules was developed in order to categorise schools as higher-, mid-, or lower-performing. Whenever groups of schools are compared it is inevitable that some will perform at higher levels than others. Thus, the decision was made to use the terms *higher-performing* and *lower-performing* as opposed to *high-performing* and *low-performing*. In this thesis, a lower or upper quartile mark was used to differentiate 25% of all schools as either higher- or lower-performing schools, with the rest deemed to be mid-performing.

The same method of using indicators was developed and used to identify schools that could be categorised as *Improving Schools*. It was considered important to assess schools that were improving regardless of their present level of performance, because this focus on striving for continual improvement in academic outcomes is, or should be, the aim of principal leadership (Elmore, 2004; Fullan, Cuttress, & Kilcher, 2005). Thus, indicators were developed to assess which schools were improving most consistently over time.

In Study 2, data on the instructional leadership of principals and the cultures of their schools were gathered and analysed to assess what instructional leadership behaviours secondary principals used, how instructional leadership was associated with school culture, and what effect differing dimensions of

instructional leadership (indirect and direct) had on school performance. The instructional leadership behaviours and attitudes of the broader senior management team and school staff were used as indicators of the culture of the school. Their behaviours were also categorised as direct and indirect instructional leadership, and patterns in the data were investigated in order to shed more light on the manner in which secondary principals impact on the culture and performance levels of their schools.

Thesis Organisation

In Chapter 2, I describe Study 1 which addresses the question of how the relative performance of New Zealand secondary schools can be assessed. This chapter has a literature review related to secondary school performance embedded within it. Chapter 3 is a literature review about the instructional leadership of secondary principals. Chapter 4 describes the development of a survey to assess principal instructional leadership and school culture, and again incorporates a literature review as well as a description of how the survey was developed. Results of Study 2 linking principal instructional leadership and school culture to school performance levels (as assessed in Study 1) are described in Chapter 5. Chapter 6 concludes the thesis with an overall discussion and links some of the points about the New Zealand system referred to in Chapter 1 to the results.

Conclusion

Throughout this thesis I argue that a broad conceptualisation of instructional leadership is required to assess principal instructional leadership in secondary schools. This concept needs to account for both direct and indirect instructional leadership behaviours as both have an impact on school performance, and the current tendency to only define behaviours that directly impact on teachers as instructional leadership could have detrimental effects. While the direct instructional leadership behaviours are more traditionally associated with the concept of instructional leadership, I argue that indirect behaviours are currently undervalued and are critical to effective instructional leadership. Both direct and indirect behaviours need to be considered and utilised in response to the unique challenges that each school faces.

Chapter 2: Assessing School Performance—Study 1

In this chapter, I describe the development of a tool to measure the comparative performance of secondary schools, and then report on the findings. First, the New Zealand qualification for secondary schools—the National Certificates of Educational Achievement (NCEA), is described so that decisions about the use of NCEA as a school performance indicator can be understood. Then, methods commonly used by researchers to compare school performance are briefly described, and research on trends in secondary school performance considered. In the latter part of this chapter, the system of school comparison proposed here is described, and finally, the results of this analysis are presented and discussed.

The National Certificates of Educational Achievement

The NCEA system was first introduced into New Zealand secondary schools in 2002, and replaced the previous assessment system that utilised a single examination at the end of the year for students in what was then called Form 5 (who sat School Certificate in what is now called Year 11), and Form 6 (who sat University Entrance in what is now called Year 12). The move to NCEA was a radical change from the previous system that was simple to understand and appeared to provide certainty. A mark in one end-of-year examination appears to be objective to the public, but tests are not completely objective. They are subject to judgements about content and levels of difficulty, just as the new qualification system of NCEA requires judgements (Peddie, 1992).

The National Qualification Framework (NQF) was developed to support the education system to offer courses better-suited to the student population they serve, and to ensure that all students could benefit from staying on at school and have their learning recognised through a system of gaining credit for learning outcomes (Hipkins, 2006; New Zealand Qualifications Authority, 2009; Strachan, 2001). A number of certificates of achievement can be offered under the NQF. The NCEA is one such qualification, and is the ‘new’ national school leaver qualification for New Zealand.

NCEA is a system that is capable of recognising learning in both academic and vocational spheres. The public is familiar with subjects such as English, mathematics, and science, but schools under the NCEA system can offer a wide menu of courses within these core subjects, as well as a variety of optional

offerings (such as horticulture, drama, and photography, for example), and recognise the learning with the NCEA assessment system. Another major advantage of the new system is the ability of all credits for learning to be “accumulated for a wide range of other National Certificates registered on the NQF”, not just for NCEA (Hipkins, Wylie, & Hodgen, 2007, p. 5). Thus, for example, a student can start pursuing a National Certificate in Electrical Engineering while still at school, and gain NCEA qualifications simultaneously.

It is a system that requires internal assessment during the year and frequently, an end-of-year examination also to assess outcomes against established standards (Peddie, 1992). Two types of standards exist: unit standards and achievement standards. Unit standards are developed by experts in their fields to measure learning outcomes, often in trades and technical subjects. Achievement standards are developed by the Ministry of Education to measure the more traditional school curriculum subjects. Schools can make use of both types of standards to assess the teaching that occurs in different subject areas. All standards are aligned to a level on the NQF. Levels 1 to 3 are secondary school level, Levels 4 to 7 are advanced trades or higher technical qualifications, with the highest postgraduate standards being at levels 8 to 10 (New Zealand Qualifications Authority, 2009).

The NCEA allows students to gather credits from their various courses (and perhaps, from different institutions both at secondary and tertiary levels), and it is the accumulation of the right numbers and combinations of these credits that results in a qualification (New Zealand Qualifications Authority, 2009). A typical secondary school course may offer 24 credits (Hipkins, et al., 2007; Post Primary Teachers' Association, 2008; Vlaardingerbroek, 2006), but schools can offer a variety of courses of learning for students with varying amounts of credits. The number of credits offered is aligned to the expected hours of course work undertaken (Post Primary Teachers' Association, 2008). At all levels of the NCEA, a student must gain 80 credits in order to pass a level but at Levels 2 and 3, 20 of those credits may be cross-credited from lower levels. Credits are gained for demonstrated learning outcomes; what students show they know and can do (New Zealand Qualifications Authority, 2009).

Hipkins, Vaughan, Beals, and Ferral (2004) described three different types of courses that schools are offering under this system. The first is the traditional type of academic course that is usually assessed by

achievement standards with courses organised around those standards. The second type of course may use a mix of unit and achievement standards to assess learning, and involves a mix of standards designed for different curriculum areas. The example the authors provided was of a “Home Economics course with health curriculum achievement standards and food industry unit standards” used for assessment purposes (Hipkins, et al., 2004, p. 2). These authors suggested that these courses are more commonly found in the arts and technology curriculum areas, but innovative locally designed courses can be created in any curriculum area. The third type of course emphasises practical skills with unit standards mainly used to assess course work. These courses are frequently developed for students with less academic ability and more interest in vocationally oriented skills (e.g., in forestry). Thus, a school is able to design the type of courses that suit their students and then assess the learning with a range of tools against the standards on three levels.

Level 1 is the lowest level and has replaced the previous external examination (School Certificate) held in New Zealand at Year 11. Level 2 has replaced the University Entrance examination at Year 12, and a third level of NCEA has replaced Bursary examinations in Year 13 (Vlaardingerbroek, 2006). Level 1 is atypical in that students must gain a minimum stipulated number of mathematics credits and English or Te Reo Māori credits (henceforth referred to as *minimum literacy and numeracy credits* or *minimum credits*) in order to meet the Level 1 requirement for a certificate, although if students later intend to go to universities they need more credits in these subjects (Shulruf, Hattie, & Tumen, 2008)¹.

The NCEA has been surrounded with controversy since its inception (Hipkins, 2006; Meyer, McClure, Walkey, McKenzie, & Weir, 2006). From the public’s point of view, much of this controversy centred on the difficulty of understanding NCEA, a fear that it represented a lowering of standards, and a perception that more able students were neither being challenged nor having their higher abilities recognised by the system. From the teachers’ point of view, the controversy centred on the workload involved in assessing NCEA, the adequacy of support provided in implementing a new system, and suspicion that some schools were abusing the internal assessment components of the system to gain higher pass rates than their students deserved (Hipkins, 2006; PPTA, 2008). This controversy and public pressure have led to incremental improvements that are increasing the system’s credibility and

¹ The requirements for NCEA continue to change. (See Madjar & McKinley, 2011 for an easy to read guide.)

reliability as a measure of student achievement in the eyes of the public, teachers, and students themselves (Hipkins, Vaughan, Beals, & Ferral, 2004; Meyer, McClure, Walkey, McKenzie, & Weir, 2006).

Mistrust of the NCEA has often centred on the range of assessment activities and potential credits being offered by schools. For example, individual school practices have sometimes resulted in students gaining enough credits to pass a course without sitting any external examinations. Some course options developed by schools were also perceived to be “easy NCEA credits” (Hipkins, et al., 2004, p. 3), even though all credits are aligned to standards. Practices such as these have resulted in various criticisms of the NCEA: that it is not adequately motivating, that it does not challenge students, and that students tend to focus on accumulating credits as opposed to learning (Hipkins, et al., 2004; Kear, 2008).

Schools set their own policies and practices regarding assessment (Hipkins, et al., 2007). Up until 2010, schools could, for example, offer multiple internal assessment opportunities for students, so that if their work did not reach a required standard at a required time, they could provide further evidence of having reached a standard or re-submit revised work for assessment (Hipkins, et al., 2007). These *resubmissions* and *further assessment opportunities* could also involve a student producing samples of work from another subject that demonstrated that a standard had been met. Again, this left schools open to some potential criticism as there was no standard practice to determine how many reassessment opportunities a school should allow. It appears from recent research in a sample of 194 secondary schools (or 64% of all New Zealand secondary schools), that about 90% of schools did offer some further assessment opportunities (Hipkins, 2006). Some viewed these practices as powerful ways to enhance student learning, and some saw them as a lowering of standards in the education system. By 2010, the policies regarding these practices were amended so that the same standards for resubmission and further assessment applied to all schools (New Zealand Qualification Authority, 2009).

Schools’ assessment practices are monitored and reported on by a national agency, the New Zealand Qualifications Authority (NZQA). The reports are not publicly available and up until 2008, moderation of teacher judgements on internally assessed work by NZQA involved the schools submitting samples of work chosen by the school. This practice has now been replaced by a larger-scale moderation system whereby each school must submit a random sample of its work for external moderation (New Zealand

Qualifications Authority, 2008). This new practice of random moderation and the alteration to reassessment practices are likely to impact positively on the variability of teacher judgement and result in more reliable assessments being made as schools receive feedback on the adequacy of their judgements. Thus, NCEA results are likely to become increasingly more reliable.

Another assessment practice that led to criticism of NCEA was a lack of graded assessments such as A to D, for example, or a percentage-mark indicator of how well students achieved a course. Rather, students were awarded an *achieved* or *not achieved* endorsement on a course. The NZQA has addressed this issue. From 2008 onwards, results notices record *not achieved*, *achieved*, *merit*, and *excellence* endorsement on subjects. To attain the endorsements, students need to achieve a certain number of credits at merit and excellence level in certain pre-determined subjects (Ministry of Education, n.d.). Similarly, NCEA certificates are now endorsed if students “gain sufficient merit or excellence grades for achievement standards” (Ministry of Education, n.d., p. 1). These changes are expected to motivate students to achieve at higher levels. As with the other improvements to the system that have already been referred to, these modifications are expected to increase teacher and parent confidence in the reported results of schools.

Using NCEA Results as Indicators of School Performance

For the purposes of this study, publicly available indicators were required from the New Zealand system to assess the relative performance of secondary schools. Consideration was given as to how appropriate the NCEA data was as an indicator as compared, for example, to an external examination system which is generally used in other countries. In comparison, NCEA offered some apparent advantages as an indicator of both student learning and school performance because the system of assessment is so closely aligned to the school curriculum.

First, in order to gain Level 1 NCEA, students must gain the required minimum literacy and numeracy credits. Given this is a prerequisite, it seems reasonable to expect a well-run school to be capable of ensuring that students gain these basic skills, and attain these credits through careful monitoring of students’ progress and the provision of further learning and assessment opportunities. Success in education is denoted by a qualification. Students cannot gain the most basic qualification (NCEA 1)

without the prescribed minimum literacy and numeracy credits. Therefore, a school's failure to ensure that a large majority or at least improving numbers of their students gain these, could be considered a failure of the most basic kind and a reasonable indicator of a school's poor performance. An effective school could be expected to monitor students' performance and steer students towards success by providing courses that interest and motivate them and ensure they learn these basic skills and as such, gain the minimum credits. Hence improvement in the uptake of these minimum credits is the first criterion described here and is used in two of the five indicators described later—the two that relate to identifying *Improving Schools*.

Second, the flexibility of courses that can be offered, the ability for further assessment opportunities, the “so-called bottomless” (Hipkins, et al., 2007, p. 5) nature of Level 1 (Level 1 standards could be pitched at a variety of curriculum levels and had no lower limit up until 2011), and the ability to offer alternative unit standards as well as achievement standards, means that a school could theoretically, ensure that a large majority of students achieved at least NCEA Level 1. If a school has designed a curriculum well-matched to students' interests, abilities, and needs, and if the system is well-monitored by management, there seems little reason why most students could not gain this qualification in a well-run school. At the heart of it, NCEA is a system designed to bring together qualifications that recognise vocational skills as well as academic subjects (Hipkins, et al., 2004). This is not a system designed to fail half the population (as did the previous School Certificate system). Level 1 is designed to recognise all learning (Kear, 2008). Not all principals will view it in this way. Some, constrained by the pre-NCEA system of courses and examinations, will continue to offer the same subjects they have always offered and offer only one assessment opportunity. Others will make use of the flexibility of the system. Results at Level 1 should therefore be a good indicator of a school's adaption to the NCEA system, and its ability to serve all its students, even those who are not highly able, by offering well-constructed, appropriate, and interesting courses of study. The second criterion suggested in this chapter for assessing school performance is, therefore, a school's ability to support its students to gain NCEA Level 1.

This ability to manage the learning systems for the benefit of students also applies at Levels 2 and 3, but because these higher level qualifications do have a *floor* to their standards (as all standards have as of 2011), students must have the prerequisite skills to attain the higher levels. If students are to gain Level 2 and 3 qualifications, they firstly need Level 1 courses targeted at an appropriate level to support them

into higher learning. This may mean that students of lower ability may firstly need to develop competencies that may be demonstrated with the attainment of unit standards of a very basic nature, then go on to take a course of study pitched at a higher level, but still within the NCEA Level 1 framework to develop the required skill level to go onto Level 2 courses. Thus, schools that could be considered exemplary will try to ensure that they scaffold their students' learning appropriately, by using the best standards to match their students' developmental needs and ensuring that as many students as possible are capable of working at higher levels in subsequent years.

Level 3 NCEA was considered a good indicator of high levels of performance, as students who attain this level of performance, particularly those with *merit* and *excellence* endorsements on their courses, tend to succeed at first year university study (Scott, 2008; Shulruf, et al., 2008). Shulruf and colleagues (2008) investigated the predictive validity of NCEA and the Cambridge International Examinations (CIE)—a normative assessment system involving one-off examinations that is used in addition to NCEA by some schools in New Zealand. These researchers found the best model to predict success in the first year of university was based on NCEA. The level of relationship for CIE was similar to other examination results from around the world—a .30 correlation, whereas the NCEA system had a correlation of .52, a much stronger relationship than that of solely examination-based systems. They stressed that this is about predictive power, not the worth of the assessment system, and suggested that NCEA may be more predictive because it uses a system that is similar to the university method of assessment, which involves internal assessment during the year plus a final examination.

Two other studies examining Year 13 success with NCEA and first year university results concluded similarly. Zhang and Marsh (2006) found that Level 3 results in economics were an excellent indicator of first-year performance in economics at university, and like Shulruf and colleagues, found that the higher the grade point average of the qualification (in terms of credits with merit or excellence), the stronger the relationship to first-year university success. James, Montelle, and Williams (2008) drew the same conclusion after linking first-year university results in mathematics with NCEA Level 3 results. They found an “excellent correlation between high achievement at NCEA and high achievement in first-year mathematics” (p. 1044).

It can be tentatively concluded on the basis of these research papers, that NCEA Level 3 is at least an adequate predictor of tertiary level success and therefore, that school performance in NCEA Level 3 is likely to be a reasonable indicator of a school's ability to provide a curriculum well-suited to its more able students, just as NCEA Level 1 is a good indicator of a school's ability to cater for all its students.

In summary, the position taken thus far is that Level 1 results are considered a good measure of a school's ability to manage the curriculum and student learning for all learners regardless of their innate ability or past learning record, while the uptake of Level 2 and 3 qualifications is a good indicator of a school's ability to enhance learning opportunities for students. In this way, these NCEA results clearly reflect a school's management of the curriculum and student learning, and as such, reflect strongly on a school's leadership.

Using NCEA Results as Indicators of Improvement

In a similar way, the ability of a school to improve its results over time was considered a good indicator of school performance. Given that the introduction of NCEA represented a radical change in systems and school leaders have had to lead change over this time, improvement in NCEA results was viewed as a good indicator, not only of student performance, but also of school performance. Study 1 uses data from 2004–2007 to assess comparative school performance. In 2007, 26.6% of students at Year 11² did not gain their minimum literacy and numeracy credits rendering them incapable of gaining NCEA Level 1. If schools had a strong learning focus, they should have been able to improve results for all students from the inception of the NCEA system, by carefully monitoring the uptake by students of the minimum credits and amending teaching and assessment practices to ensure that most students did achieve these and therefore were in a position to achieve Level 1. Improvement of all students in gaining these minimum credits and NCEA 1, 2, and 3 was therefore considered an indicator of effective school self-review and leadership.

The second indicator of school improvement was an increased percentage of Māori students gaining NCEA qualifications. The performance of this group, though improving, lags behind others with little

² Data provided by the Ministry of Education.

evidence of the gap between Māori achievement levels and that of others decreasing in the period Study 1 covered (2004–2007), so improvement in this group’s NCEA results is an important indicator of a school’s performance (Ministry of Education, 2007). Raising Māori achievement is a major policy initiative (Ministry of Education, 2008) and schools are aware of the importance of this performance indicator.

Methods of Assessing and Comparing School Performance

At least six methods of assessing and comparing school performance are used in school effects research: gross productivity, value-added, regression discontinuity, growth curve analysis, multilevel modelling, and comparison of schools of similar type. The first approach described here, gross productivity, attempts to assess the relative performance of schools and puts no weighting on the context of schooling. All of the latter five approaches are attempts to reach fair conclusions about the effectiveness of schools (as opposed to the ability of students), by somehow taking into account the levels of prior achievement of students and their socio-economic setting. Each of these methods is briefly explained with some shortcomings and advantages noted, before describing the method used in this study. This method attempts to amalgamate some features of these various approaches into one that is appropriate in a New Zealand setting, and useful for identifying which schools probably require further support and which schools may have levels of experience and capability which could be made available to others.

Gross Productivity

This method is the one commonly used by newspapers when publishing school examination results. The percentage of students passing a given qualification (at some level of competence, such as the percentage of Level 1 passes) is published. Additional information may be provided about each school, but little attempt is made to interpret the students’ scores in terms of such contextual variables as the socio-economic status of the school community.

The gross productivity means of identifying schools is a commonly used measure, because it is easy data to discover, present, and sometimes, as in New Zealand, it is the only data made available. While gross productivity measures take no account of the varying contexts that school leaders operate in, and thus

reveal little about a school's performance, this method of comparison still provides important information on student achievement. All students need to gain minimum standards in literacy and numeracy if they are to lead a productive and satisfying life, and gross productivity measures provide that information. Further, it is frequently noted that the general public has an interest in knowing how many students are doing well in real (gross productivity) terms, as schools are publicly funded and expected to serve the purpose for which they were designed—to educate the future generation. The unfairness of using such information as the sole indicator of school performance can be seen by imagining a school whose students had previously been excluded from other schools for poor behaviour. A 30% success rate with such students could indicate that the institution was highly successful with difficult candidates. Thus, the gross productivity information needs to be supplemented with information that takes student background characteristics into account. The next five methods control in various ways for differences in student background in order to more precisely determine the value a school adds, or the *school effect*.

Value-added Modelling

A *value-added* method addresses the issue of the comparability of schools by comparing the actual level of performance of students with the level predicted on the basis of their prior attainment or background characteristics. Statistical modelling, usually via hierarchical linear modelling, allows school effects to be expressed as the difference between the actual results and those that are mathematically predicted. Schools are categorised as higher- or lower-performing, depending on the extent to which they perform better or worse than predicted. Value-added methods are generally favoured where results on individual students can be gained and an assessment can be made of the improvement in learning at an individual level. Without data on student achievement at the individual level, hierarchical linear modelling cannot be utilised.

This second method is not without its critics. In many countries where the between-school variance of achievement is quite small (as in New Zealand), value-added models often show few differences between schools—which is not surprising given that the majority of variance is within schools (Alton-Lee, 2003). Also, the standard errors in these models are often sufficiently large that they obscure true differences between schools. Van de Grift (2009) also pointed out that different value-added methods can produce quite different results. In addition, in some studies, up to 20% of students were prevented

from engaging in tests, and in others, students were so transient that the school did not have the students long enough to show an effect. Some schools had very high percentages of students repeating a year, while others had none. To leave this type of data out of calculations, van de Grift argued, distorts the interpretation of the data because these factors frequently reflect aspects of the school's performance that should be considered. All of these factors are difficult to account for in any model.

Regression Discontinuity

The third method, regression discontinuity compares pupils in adjacent grades and essentially deducts the effect of age to gain a valid measure of schooling effects (Sammons & Luyten, 2009). This method of analysis is dependent on students being assigned to a certain grade on the basis of their birthday. For example, in England, September 1 is the cut-off point distinguishing between two cohorts of children resulting in students of similar ages being assigned to differing class levels.

Within each grade, the relationship between age and achievement is estimated. If the data analysis reveals a discontinuity between the oldest pupils in the lower grade and the youngest ones in the upper grade, this is interpreted as the effect of 1 year extra schooling (i.e., being in the upper grade) (Luyten, Tymms, & Jones, 2009, p. 146).

A key advantage of regression discontinuity is that it does not require prior achievement levels to assess the effects of schooling. It does, however, require data on each individual student's age as well as their levels of achievement. Obtaining such data is not always possible, or may mean that only a relatively small sample of schools can be subjected to analysis.

Growth Curve Analysis

The fourth method, growth curve analysis, measures progress over multiple points of time. *Seasonality of learning* is a type of growth curve analysis that assesses school effects by comparing growth over the long summer vacation (in the United States) to growth during the rest of the academic year. By measuring the holiday period growth (or regression) over three months of no schooling and the growth over the nine academic months, the effect of schooling can be assessed.

While the benefits of assessing growth are not disputed here, as with the other methods, growth curve analysis has drawbacks. Once again, it requires student level data on test scores over time, and if comparisons are to be made involving socio-economic status (SES) factors, some means of assessing SES for each student would also be required. Gathering this amount and type of data is likely to mean that, in many cases, research using this methodology would be restricted to small samples. This method is also unlikely to be useful where students do not have one long break during the year, but rather, more regular shorter breaks, as in New Zealand.

Multilevel Modelling

If student level data were available, these latter two methods (growth curve analysis or regression discontinuity) may be preferred options for gaining a fair assessment of school effect that does not rely on comparisons between schools. More commonly, the fifth method, multilevel hierarchical modelling, is referred to as the preferred value-added model of assessing school effects (Goldstein, 1997). This modelling method can take into account multiple levels of membership to different groups (e.g., gender, ethnicity, prior achievement of student, current teacher, and current school). But, once again, this fifth method has drawbacks. It is only as good as the quality of the data utilised, is reliant on individual-student data that rules it out as an option for most researchers in New Zealand, and is not as straightforward as other methods that may produce a comparable result (Cohen, Manion, & Morrison, 2007). In addition, this method does not allow fine distinctions to be made between schools (Goldstein & Spiegelhalter, 1996; Sammons, 1996) and “reference to the confidence limits attached to estimates of schools’ effects (residuals) is needed to establish the statistical significance of any apparent differences in effectiveness identified” (Sammons, 1996, p. 142). Thus, although confidence intervals may overlap, this does not imply that there is no difference, or a lack of significance. Rather the overlap suggests that the relative performance levels of many schools cannot truly be distinguished.

Schools of Similar Type

The sixth method does not require student level data and yet still attempts to make a fair assessment of the relative value schools are adding. The schools-of-similar-type method compares schools that serve students from similar communities. Typically, SES indicators are used to decide on similarity or

difference, and only schools of similar type are ranked and compared to assess the success of a school. Thus, a school is either performing better, worse, or similar to most other schools of a comparable SES category or with a similar ethnic mix of students. Again, it is a method that has its champions and its detractors. Salganik (1994) argued that this method lends itself “to clear and understandable reporting” (1994, p. 137). Willms and Kerckhoff (1995), on the other hand, described this method as appealing in its simplicity but potentially misleading as small changes in the use of indicators can change schools’ rankings dramatically.

A key issue when using this method is how to ensure that schools of similar type are really being compared. In the United States, the indicator that is generally used to measure SES is the number of students provided *free lunch* (e.g., Heck, 2000; Verona & Young, 2001). Some studies (e.g., Verona & Young, 2001) also use indicators of attendance and mobility as indicators of school community. Other studies use levels of parent education or parent education plus occupation (e.g., Luyten, 1994), percentage of minority students in the school and percentage of students with English as a second language (e.g., Salganik, 1994), or parents’ occupation and education and number of siblings (e.g., Willms & Kerckhoff, 1995). These differing methods of analysing socio-economic data represent widely varying proxies for SES. The issue with the reliability of these differing categorisations is evident—one method will not produce exactly the same result as another.

In New Zealand, the Ministry of Education uses *decile ratings* based on five indicators to assign schools into bands of similar characteristics. Deciles are calculated from census information from the area that students live in: household income, parental occupation, household crowding, educational qualifications, and the percentage of parents receiving government benefits (e.g., for unemployment or sickness). These indicators are adjusted after each census, and while the particular characteristics of one school’s population may not have changed, if the characteristics of other schools have changed, this may cause a given school to move up or down in decile, as by definition, only one-tenth of all schools can be in any given decile band.

This type of system seems to have gained acceptance in New Zealand schools. Every New Zealand secondary school is able to see how its uptake of qualifications compares to similar schools by

comparing the percentage pass rates of students in the same decile band on a secure website (School Smart), and every New Zealander can now compare a secondary school's performance to any other school or group of schools on the NZQA website. In this way, schools and the public in general are able to see how schools compare with others of similar decile and type. Thus, New Zealand secondary schools are familiar with, and apparently accepting that a schools-of-similar-type method of comparison can be useful.

A schools-of-similar-type model is used in this study because, firstly, student-level data such as that required in most of the value-added models, are not available in the public arena. Secondly, it is possible to use the Ministry of Education's decile rankings as a basis for forming comparable schools in terms of student cohorts. Thus, what follows now is a description of how three indicators were used to categorise schools according to performance into higher-, mid-, and lower-performing groups, and how two indicators were used to assess a school's ability to improve results over four years. These indicators were aggregated to inform a judgement about the relative performance of secondary schools.

Assessing Relative Performance

For any given school performance indicator, rules are needed to establish the level at which a school will be judged as higher-, mid-, or lower-performing on the given indicator. There is a degree of arbitrariness about where the cut-off scores are established, and the decision may reflect the amount of resource to be allocated or some other rationale, depending on the purpose for analysing the data. When multiple indicators are used, combination rules are needed to determine the final classifications of each school. For example, if student achievement in multiple subjects is analysed, should scores on each subject be weighted equally or should differential weightings be used?

Ammar, Bifulco, Duncombe, and Wright (2000) wanted to identify lower-performing schools in New York so that assistance could be targeted to these schools. They argued that using the mean performance of a school can mask the effects of a few high performing students, so preferred to use the percentage of pass marks in tests. They used results in mathematics and reading tests, and then used a set of rules to identify the schools on these indicators that could be identified as lower-performing.

These researchers showed that by using three different rules, a large pool of schools could be identified as being lower-performing, but that some schools would appear on all lists regardless of the rules applied. Their challenge was to design a system that could reliably identify those schools in most need of assistance to improve student achievement. They described the different combination rules as the *or*, *and*, and *average* rules. The *or* rule implies that being low on one or other test, categorises a school as lower-performing. The *and* rule implies that a school needs to be low on the two tests to be categorised as lower-performing, and the *average* rule implies that the average of the school's results are determined as low or not, depending on an arbitrary cut-off point.

Decisions on the cohorts, indicators of performance, combination rules, and cut-off points can cause varying lists of schools to be identified. Ammar and colleagues (2000) argued, however, that the use of combination rules to aggregate numerous data reduced the risk of an unreliable result, especially for schools at the margins of performance groups, as these rules could build in expert judgements and ensure they were applied impartially.

It is desirable to use multiple indicators, but this makes the task of combining data more difficult and some expert judgement in the form of rules is required. For example, in the Ammar and colleagues' study (2000), a reading test was considered a more important indicator than a mathematics indicator, and so a low reading score automatically resulted in a school being included in the lower-performing group, whereas a low mathematics score in combination with an adequate reading score did not. These researchers suggested that expert judgements could be useful in "determining the relative importance of various outcome measures" (Ammar, et al., 2000, p. 264), rather than being used to change any particular school's ranking once it had been determined by a method.

Ammar and colleagues trialled methods of aggregating data using these three rules on three years of data for each school's mathematics and reading results, providing 18 different lists of ranked schools. Each method generated 30 to 32 lower-performing schools with a total of 82 different schools identified in total. Just over half of these schools were identified by all methods, and about a quarter by one method only. The researchers then set about developing rules for aggregating these rankings by the

different methods into one score. The development of the rules allowed judgements to be used in a consistent way and is the type of method that will be described in this chapter.

As pointed out by these researchers, most methods of identification will agree on the worst performing schools, but it can be difficult to assess the performance of schools at the margins. In a day-to-day sense, there may be no need to firmly categorise schools but when, as here, data on higher and lower performance levels are required to match with other data, these decisions may impact on results and thus need to be based on a method that is as robust as possible. The method described later in this chapter takes a similar approach to Ammar and colleagues when aggregating different indicators, but one major difference between their study and what is described here, is the importance attributed to schools that are improving.

Assessing Improvement

The schools-of-similar-type method, while useful in that it provides a means of assessing current performance levels in a manner that takes into account the differing SES effects, does not normally take into account a school's ability to perform in comparison to past performance. It is important to assess improvement over time (Goldstein, 1997) as well as current performance levels, in order to take account of the differing circumstances affecting schools. Attaining improvement in school academic performance will be subject to different constraints in different settings. If a school is higher-performing, it may have to work hard to retain that performance level, whereas if a school is truly underperforming with its cohort, it may be able to quickly gain improvements (Wellisch, MacQueen, Carriere, & Duck, 1978). It seems reasonable to conclude that both high and improving performance, are indicators of good school performance, and that both should be recognised by any system seeking to categorise schools into performance groups.

As noted in the previous section, assessing improvement over time with different cohorts can occur in numerous ways, but some research from the United Kingdom indicates that secondary school performance does not alter greatly in many schools, nor does improvement necessarily occur quickly, though a slight upward trend overall may be detected (e.g., Gray et al., 1996). New Zealand NCEA data showed a consistent upward trend in results over the period of assessment by NCEA considered here

(i.e., 2002–2007). For example, the proportion of students gaining NCEA Level 2 qualifications increased by 14% between 2003 and 2006 (Ministry of Education, 2007). This improvement, however, may partially reflect schools' adaption to the new system of learning and assessment as much as an improvement in student learning outcomes (Hipkins, et al., 2007). Similar comments have been made about the rising performance in schools in the United Kingdom (Gray, Goldstein, & Thomas, 2001; Thomas, Peng, & Gray, 2007). Some improvement is attributed to schools using such strategies as targeting students that are 'close' to gaining qualifications, or encouraging more able students to take more courses. That is not to say, however, that such strategies should not be used, so long as they benefit the students. As argued in Chapter 1, the good of *all* students needs to be the criteria for good decision making about strategies for improvement.

Given that NCEA results appeared to be trending slightly upward, analysis was required to assess which schools were improving more than others, and what kind of trends were evident at the individual school level. Gray, Goldstein, and Jesson (1996) did this with a value-added study involving 30 secondary schools in the United Kingdom. This study used GCSE results from 1985 to 1990 as achievement measures and a reading test taken on entry to secondary school as the measure of prior achievement. Gray and colleagues (1996) found that schools in any performance group (higher-, mid-, or lower-performing) could improve, and did so at varying rates (without specific external interventions) with both higher- and lower-performing schools improving both rapidly and slowly. In the group that improved more slowly, there were more schools that were initially classified as *less effective*, as these researchers called the group (i.e., lower-performing). These researchers concluded that while schools could improve, it would take several years for a school to move from one performance group to another and few schools showed the ability to improve consistently year-by-year.

In another study, Thomas, Sammons, Mortimore, and Smees (1997) used a value-added model with three cohorts of students. They used GCSE results and a measure of prior achievement gained from a standardised reading test and the Verbal Reasoning Band (VRB) that each student is assigned on entering secondary school. This research also indicated a slight upward trend in results over the three years, but found schools to be broadly stable in relative positions, despite departmental variations, though that may be as one would expect in only three years.

Research by Gray, Goldstein, and Thomas (2001) reported similar results in another value-added study in the United Kingdom, but this time using A level results (18 year olds) and using GCSE as a measure of prior achievement. They found that the trend of a school's performance over three years was only mildly predictive of its performance in the fourth year once value-added measures were taken into account, suggesting that it may be difficult to sustain improvement. They suggested that only a tiny minority of schools have patterns that are consistently improving or declining, and that where change was most evident was in the top 5% where schools may have little room to improve but may have to work hard to maintain their performance level, thus making some downward movement likely, and in the bottom 5% where there may be greater latitude to improve. These researchers also noted that even when there was a discernible trend in one direction or another, after three years it was likely to be reversed. These conclusions using A level results may need to be considered with care given that only the most able students would be likely to be sitting these examinations, whereas students with more variable performance levels might be expected to be included in the previously cited GCSE studies. Nevertheless, this research also points to the difficulty of sustaining an improvement trend and improving relative to other schools.

The Thomas, Peng, and Gray (2007) study of GCSE results also used a value-added model. These researchers tracked the progress of individual schools over time. Sixty-three schools were categorised as *significantly lower*, *performing as expected*, or *significantly higher* and their progress tracked on 10 years of GCSE results year-by-year through to 2002. When value-added data were used, half of these schools managed some improvement over the 10 years with 2 out of 21 managing to transform from lower-performing to higher-performing in value-added terms over that time period. In value-added terms, 16 of 63 schools (25%) had an improvement trajectory beyond that of the average school, but only four schools improved continuously over four years and only four improved continuously over five years, indicating that it is difficult to sustain an improvement trajectory with only 1 in 16 succeeding in this longer-term improvement trend. Nonetheless, this percentage of improving schools was larger than had been calculated by previous research. Thomas and colleagues (2007) concluded that the majority of improving schools could typically improve for three continuous years, but these changes in performance did little to alter the relative performance of schools compared to others in terms of their raw data (gross productivity). By way of contrast, when raw data were tracked over the 10 years, 22 of the 25 lower-performers remained in the *significantly lower* group, and notably, none of those that started

with a *significantly lower* designation moved into the *significantly higher* category over the 10 years. Thus, patterns using raw data as opposed to value-added data demonstrated a less optimistic picture of relatively stable school performance.

The above findings are subject to numerous possible criticisms. Schools do influence which students enter examinations often restricting the less able student from attempting examinations, thereby inflating pass rates. In addition, many students would leave school without sitting examinations, possibly affecting data used to calculate school performance levels. Moreover, various indicators of achievement are often amalgamated to produce one overall indicator of school performance as opposed to revealing the wealth of information available at the school, and may or may not be a good indicator of actual performance (Ammar, et al., 2000; Rowan, Raudenbush, & Kang, 1991; Salganik, 1994). The measures of prior achievement frequently cited in the aforementioned studies are often challenged. Some argue that verbal reasoning scores, reading scores, and general intelligence scores are too open to influence from homes and are not a good measure of prior performance, or that what is tested is not what is taught in schools (e.g., Luyten, 1994; Rowe, 2004).

Nevertheless, very tentatively, it is suggested that recent research indicates that it may be difficult for secondary schools to sustain an improvement trend for more than three years, and that changing performance bands in value-added terms may be possible, but relative rankings in achievement in raw score terms may be unlikely to change. Because of this, assessing improvement in school performance seems a critical indicator of effective leadership. Some schools may be able to improve because they have a greater mandate for change from staff and community particularly if there is clear evidence of a need for improvement (Rowan & Denk, 1984). On the other hand, if a school is poorly performing and there clearly is a need to improve, improvement may be viewed as virtually impossible due to the perceived level of challenge. The potential difficulty of gaining and sustaining improvement in a secondary school influenced the system developed in Study 1. It is described in the third section of this chapter.

The aim of this thesis is to identify schools in different performance categories in order to assess any relationships with principal effectiveness. This will be done by linking the instructional leadership

practices of principals with the 2004 to 2007 NCEA data. In this case, higher-performing schools will be identified as those that are either maintaining high standards compared to similar schools, or schools that are improving.

Identifying improving schools is important in this exercise if the data are to be correlated with data on principal leadership. The research cited previously indicates however, that if a school is already higher-performing, it may be more likely to have a downward trend in performance, as there may be little room for improvement if the school is working to capacity for the students it is serving. If a school is performing poorly or perhaps, *cruising*, there is more room to improve and presumably, the capacity to do so exists, although the research already cited seems to indicate that it is very difficult to improve lower-performing schools and to sustain improvement trends.

The method described in the next section to classify the performance levels of New Zealand secondary schools differs from similar tools, in that it was designed to measure one indicator of gross performance, two indicators of value-added performance, and two indicators of school improvement over time. In addition to measuring these three types of performance, the classification system had to use publicly available school-level data, had no prior achievement data to access (because standardised data is not collected prior to Year 11), and had to be workable for a large sample of schools.

Developing a New Zealand Model for Identifying Relative Academic Performance

Sample

Two samples are reported on in this study. First, all secondary schools that taught Years 9 and above or Years 7 and above in one Ministry of Education district (New Zealand has four ministry districts), were included in the analysis—102 schools in all. This is the sample referred to as *all schools* in this study. Seventy-two of these schools that could be defined as secondary schools (as opposed to the area schools that cater for Years 1 to 13) were invited into the instructional leadership research—30 (or 42%) agreed. As can be seen from Table 1, there was a fairly even spread of schools from low decile (1 to 3), middle decile (4 to 7), and high decile (8 to 10) areas in the sample. These 30 schools, henceforth

referred to as sample schools, were then categorised through their rankings on the school performance and improvement indicators after NCEA results on all 102 schools were assessed.

Table 1 Schools by Decile Group

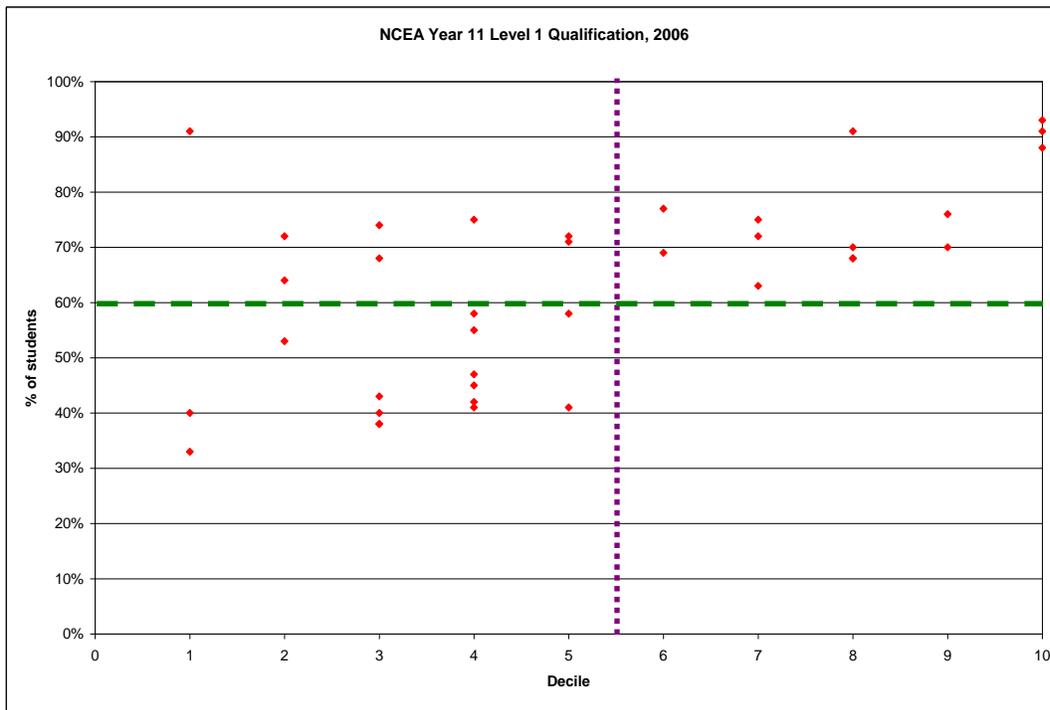
Decile	1	2	3	4	5	6	7	8	9	10
No. of schools	5	4	3	1	5	2	1	5	4	0
	12 low decile schools			9 middle decile schools			9 high decile schools			

Indicators for Assessing Relative Performance

Five performance indicators were used to create five ranked lists of schools by using NCEA data. Three of these related to the relative performance of schools in NCEA 1, 2, and 3, and two related to improvement in results over four years.

Indicator one was school performance (percentage of passes in NCEA 1 to 3 over four years) relative to a benchmark. While other methods could well have been used (such as comparison to national averages), a benchmark was established by examining the patterns in one year’s NCEA data for the 102 schools. As deciles can be considered a proxy for prior achievement, the pattern of school achievement was compared to their decile. On examining this data, a clear pattern became evident in that most of the decile 6 to 10 schools sat above the following pass rates: NCEA 1—60%, NCEA 2—55%, and NCEA 3—40%. This pattern is illustrated in Figure 1 for NCEA 1 using a sample of these 102 schools (for reasons of pictorial clarity), and shows that the range of results evident for the decile 1 to 5 schools was very much wider than that of the decile 6 to 10 schools. This clear pattern of a wider range of results was evident for each level of NCEA for deciles 1 to 5, and thus the minimum level achieved by decile 6 to 10 schools in that year in this region of New Zealand was used as a benchmark with which to compare all schools.

Figure 1 NCEA Level 1 Percentage of Passes by Decile for a Sample of Schools



All 102 schools were allocated one point for being within 5% of the benchmark and two points for being more than 5% above the benchmark for Levels 1, 2, and 3 NCEA over four years (2004–2007). That is, a maximum of two points at three levels of NCEA over four years or a possible total of 24 points (2 points x 3 levels x 4 years) could be allocated to a school. As we can be less confident that schools nearer the cut-off point are truly above, only one point was allocated to these schools whose performance could be considered marginal (within 5% of the benchmark), whereas where we can be more confident of being truly above the cut-off point, two points were allocated. The points were added and schools were ranked from those scoring 24 to those scoring zero. The top quartile of the 102 schools was categorised as *higher-performing* and the bottom quartile as *lower-performing* by using this *benchmark indicator*.

This indicator was designed to capture the benefits of a gross performance measure. That is, it assessed actual performance levels and gave credit to schools for reaching a standard that was being set by schools from higher SES areas. As can be seen from Figure 1, about half of the low decile (decile 1 to 3) schools attained these standards.

Indicator two was school performance (percentage of passes in NCEA 1 to 3 over four years) relative to the average of schools in that decile band. Again, two points were allocated to schools whose results were greater than five percentage points above the average for the schools in the same decile band. Data over four years and at three levels of NCEA were used. Thus, a school could gain two points for being 5% above their decile average, one point for being within 5% of the average, and no points for being 5% or more below the average. This made another total of 24 points that a school could be potentially allocated. Schools were then ranked on these results and schools in the top and bottom quartiles again identified. This performance indicator was designed to assess the value added by schools, albeit, by a schools-of-similar-type method, and henceforth is referred to as a *value-added* indicator.

Indicator three was school performance relative to the average of schools in that decile (percentage of passes in NCEA 1 to 3) also, but this time only for 2007. This was the most current data available at the time of this analysis, and was considered relevant as an indicator of schools' most recent performance levels as compared to their decile average. It was also considered more reliable than previous data due to improvements that had occurred in the NCEA system. This indicator was calculated by dividing the percentage of NCEA 1 to 3 pass rates, by the average percentage pass rates of the decile band of schools at the three levels. The three scores were then added and divided by three to produce one score or a single indicator. Again the schools were then ranked, and those in the top and bottom quartiles identified to assess the relative value-added by schools using this second *value-added* indicator.

When results for all schools were considered, some consistency in performance rankings was established regardless of the indicator used to identify schools that were relatively either higher- or lower-performing. Top and bottom quartiles of ranked lists of schools were used to categorise schools as either higher- or lower-performing. Fifteen out of the 102 schools were identified as higher-performing by two indicators, and a further eight schools were identified by all three indicators. Similarly, 18 schools were identified as lower-performing by two indicators and another nine by all three indicators. Only three schools had a mixture of high and low indicators. In two cases, the schools were categorised as lower-performing by the benchmark method and higher-performing by one of the value-added methods where schools' results were compared to those of similar schools. One school was

categorised as higher-performing by the benchmark method and lower-performing by both value-added methods, indicating that despite reaching levels that most schools in decile 6 and above attained, this school was very much lower-performing than schools of similar type both over four years and in the last year for which the data were collected. An examination of these patterns of results led to the development of the following rules for making a judgement regarding categorisation as higher-, mid-, or lower-performing.

Rules for Categorisation of Relative Performance

Rule 1: Being in a higher or lower group by the benchmark ranking is not in itself adequate to be categorised as higher- or lower-performing as this gross performance method discriminates in favour of higher decile schools by design.

Rule 2: If identified by any one of the three indicators as being lower-performing, a school cannot be in the higher-performing category. It seems reasonable that *higher-performing* needs to refer to schools that are reaching some minimum level of performance regardless of how they perform compared to similar schools.

Rule 3: If categorised by two indicators as being in a higher- or lower-performing group, the school is in that group (unless it contravenes Rule 2, e.g., two higher-performing indicators and one low, which would result in the school being categorised in the mid-performing group).

Thus, this method of reduction to produce a group that could be confidently called higher- or lower-performing is based on consideration of the consistency of categorisation by different methods.

Indicators for Assessing Improvement

All 102 schools were then ranked on the improvement indicators. Two indicators of improving schools were used. Indicator four was school performance relative to prior performance of all students. This involved assessing schools' ability to improve five outcomes for all students: the percentage of students gaining success in the minimum literacy credits, the percentage of students gaining success in the

minimum numeracy credits, and the percentage of students improving in each of Levels 1, 2, and 3 NCEA over four years. Two points were allocated for a 5% or more improvement from 2004 to 2007, one point if they were within the 5% range in terms of change, and no points if the results regressed. Thus 10 points in all could be allocated (two possible points for five assessments of improvement over a four year period) to a school.

Indicator five was school performance relative to the prior performance of Māori students, as the results for this group of students are comparatively low and therefore considered to have ample room for improvement. As improving achievement for Māori students is a national goal, a second analysis using the same points' method identified which schools had most consistently improved outcomes for Māori students at all levels of NCEA. The schools that had improved most consistently and were in the top quartile of the 102 schools by either indicator four or five were categorised as *Improving Schools*. This led to Rule 4.

Rule 4: If a school is in the highest quartile of either of the two indicators of improvement, it can be in both a performance group and the *Improving Schools* group as both high performance and improvement are considered indicators of higher-performing schools.

Table 2 illustrates a sample of results and shows the rules being applied to provide a classification. Every school is necessarily in a performance group, but those in the top quartile of either of the two improvement indicators were also classified as *Improving Schools*. For example, School 1 in Table 2 is categorised as mid-performing because it is in the highest quartile on one indicator of performance only, and is categorised as improving because it is in the top quartile of schools improving outcomes for Māori. School 2 is categorised as higher-performing because it is in the top quartile of two of the performance indicators. While School 3 is in the lowest quartile of one of the performance indicators, it is still categorised as mid-performing. If it was in the bottom quartile of two of the performance indicators, such as School 5 and School 6, it would have been categorised as lower-performing. But whilst School 6 is lower-performing, it is also categorised as improving, because it is in the top quartile of schools improving outcomes for Māori.

Table 2 Results of a Sample of Schools to Illustrate the Method of Categorisation

School	Benchmark indicator	Value-added indicator	2 nd value-added indicator	Improving all	Improving Māori	Classification
1			H		I	Mid/Improving
2	H	H				Higher
3			L			Mid
4	H	H		I	I	Higher/Improving
5	L		L			Lower
6	L	L			I	Lower/Improving

Note. H = In the highest quartile of a performance indicator, L = In the lowest quartile of a performance indicator, and I = In the highest quartile of an improvement indicator.

Cross Check of the Categorisation

Another method of combining all the lists of ranked schools including the benchmark data (that favours high decile schools), and the improvement indicators (that could favour those schools with more room to improve as opposed to higher-performing schools) was trialled in order to check the categorisation of performance arrived at via the rules method previously described. The total scores from all the indicators (benchmark indicator—maximum of 24, value-added indicator—maximum of 24, the second value-added indicator—maximum of 2, and the two improvement indicators with a maximum of 10 each), were added and then ranked to produce a list that differed from the findings of the rules method. In other words, this was a simple aggregation of all scores which were then ranked, ignoring the rules.

The top quartile of schools (higher-performing) by this second method was compared to the schools categorised as higher-performing by the rules method previously described. Twenty of the 26 schools identified by the second purely numerical method as higher-performing were also identified by the rules method as higher-performing. The other six were all identified as mid-performing, but five of these six were also identified as improving by the rules method. Only one of these six schools was identified as in the mid-performing group and not also in the improving group by the rules method, and this school was the 26th on the ranked numerical list; in other words, right on the cut-off point for the top quartile of the numerically aggregated result. The two methods were broadly consistent as any school in the top quartile of the improving indicators was considered another set of higher-performing schools by the rules method.

Then the sample schools ($N = 30$) were ranked by the second numerical method and the data for each of these schools were examined on a closer level. In addition, any relatively recent evaluations by New Zealand’s Education Review Office (ERO) were used to cross-check the performance assessments indicated in this chapter. Any evidence of performance levels contrary to my classifications was sought. The ERO carry out evaluations of school performance approximately every three years, much as the Office for Standards in Education (Ofsted) does in the United Kingdom.

Table 3 demonstrates the differences between the rules method and the numerical method by showing any differing results by the rules method in brackets. The rules method (full results reported in Appendix A) categorised 6 schools as lower-performing, 17 as mid-performing, and 7 as higher-performing. Where the two methods varied in results, the schools’ data and evaluation by ERO were examined in more depth to try to distinguish which method provided the most valid result.

Table 3 Higher-, Mid-, and Lower-Performing Schools by Method 2 (Numerical Aggregation) with any Differing Results from the Rules Method in Brackets

Lower-performing	Mid-performing	Higher-performing
School E	School Y (high)	School X
School I (mid)	School R	School V
School AB	School J (high)	School W (mid/improving)
School G	School M	School Q (mid/improving)
School AA	School B	School AD
	School F	School S (mid/improving)
	School AC	School Z
	School C (lower)	School O
	School D	School N
	School U	
	School K	
	School H	
	School P	
	School L	
	School T	
6	15	9

First, the seven higher-performing schools by the rules method were checked against any recent (2006 – 2008) ERO reports. None of the schools had any major concerns regarding their educational

performance. Though some reports indicated that weaknesses existed in the variable use of assessment information at the class or departmental level, this was infrequent and of a minor nature in that it did not refer to school-wide practices. Consistent references to positive and learning-focused leadership, high expectations, strong analysis of data, and careful monitoring and use of NCEA data apparently helped to support the judgement that these schools can truly be considered higher-performing. A feature of several of the reports was the emphasis on ensuring the careful monitoring of the minimum credits, an emphasis on striving for even better results as measured by merit and excellence endorsements despite already high performance as compared to schools of a similar decile, and the flexible use of pathways and programmes to help retain students to higher levels.

The schools that had diverging results by the two different methods were then examined in more detail. The first pattern that is obvious from looking at Table 3 is that Method 2 has three schools rated as higher-performing that the rules method categorised as mid-performing but also improving (Schools W, Q, and S).

School W had NCEA results that were consistently higher than the decile average over four years in NCEA 1 and 3, and only just failed to outperform the decile average at NCEA 2 in 2007 having surpassed that level the other three years. When the rules method was applied, this school appeared just below the cut-off mark to be categorised as higher-performing by the benchmark indicator, being penalised by not exceeding the 5% mark over the benchmark in NCEA 1 for 2004 and 2005. The school was classified as higher-performing by the first value-added indicator, but not by the second value-added indicator that took into account the most recent year's performance only. Thus, this school was close to the higher-performing categorisation. It was clearly an improving school having improved results for all students and for Māori students quite consistently. Its ERO report was exemplary in terms of its leadership, its governance, and its efforts to improve outcomes and relationships. This school could have probably been considered higher-performing on the basis of this evaluation and the raw data, and caused me to return to check the accuracy of the data that had been put into the dataset. Nevertheless, the rules method depicted this school as mid-performing but also improving, thus it was considered a higher-performing school, albeit by a different name (i.e., an *Improving School*), using the rules method.

School Q was performing consistently higher than decile averages at Levels 1 and 3 but had mixed performances at Level 2 of the NCEA. It featured in the top quartile of both improving indicators as its results in the uptake in minimum credits had improved greatly over the first two years of the dataset, and thus it was certainly improving as categorised by the rules method, and at the very least on the way to being a higher-performing school. It appeared to be doing well with its cohort that were performing poorly on entry to secondary school according to the latest ERO report, and interestingly the report noted that this school's performance was "improving" and that progress was "sustained". However, numerous improvements were required and notably one area was in the use of assessment information to inform teaching and programming. The rules method, which categorised the school as mid-performing and improving rather than higher-performing (at this stage) was, therefore, perhaps the conservative result but one that had some evidence from the ERO to support it.

A closer examination of School S's data showed that it had had a mixed performance at Levels 1 and 2 but performed well at Level 3 NCEA. It had not performed consistently higher than the decile average over the four years as might be expected of a higher-performing school, thus its categorisation by the rules method as mid-performing and improving was preferred. The school received a sound ERO report within the last two years of the data set years (i.e., 2004–2007), however one recommendation indicated that there were considerable improvements yet to be made to assessment and quality assurance practices, thus the categorisation by the rules method again appeared to be more appropriate at this stage of its development.

Of those in the mid-performing group by Method 2, but in other groups by the rules method, School J and Y appeared to be penalised by Method 2, which aggregated all data including data on improvement. These high decile schools appeared to be higher-performing and penalised for not improving in the Method 2 analysis. They exceeded their decile group's average performance consistently and at all levels. It would seem more appropriate that these schools be categorised as higher-performing as they were by the rules method.

School C was categorised as mid-performing by Method 2 and lower-performing by the rules method. A closer examination of its data showed that it had been performing lower than its decile average

consistently at three levels of NCEA over four years. It did not feature as a school that was improving over this time period. The ERO criticised this school's assessment practices and some of its teaching practice, thus it was probably better categorised by the rules method as relatively lower-performing.

School I was categorised as mid-performing by the rules method but lower-performing by Method 2. An analysis of its data showed that it was performing lower than decile average at Level 1 for three of the four years of the dataset, lower than decile average for each year of the NCEA 2 data, and higher or equal to the percentage of students succeeding at Level 3 for the decile. Its ERO review commented on improving practices, but noted that more was needed in the critical areas of the monitoring and appraising of classroom practices, raising teacher expectations, and using achievement information. Overall, it appears that Method 2's categorisation as lower-performing was a better performance fit for this school at this time.

Thus, in six out of seven cases, the results from the rules method were preferred but the two methods were broadly consistent. This evidence collectively suggested that the rules method was rigorous enough to categorise schools so that these performance levels could be correlated with instructional leadership in Study 2.

Results

All schools

As Table 4 indicates, of the 102 schools, the lower-performing ones were still more likely to be low decile schools, despite two of the three performance indicators assessing the value-added compared to schools of similar type. The mid-performing group, however, comprised a fairly even spread of percentages of low, middle, and high decile schools. The higher-performing category was dominated by high and middle decile schools, but the majority of low decile schools were categorised as mid-performing just as the majority of middle decile and high decile schools were.

Table 4 Performance Levels of Schools by Decile Band (N = 102)

	<i>n</i> (%) of low (1–3) decile schools	<i>n</i> (%) of middle (4–7) decile schools	<i>n</i> (%) of high (8–10) decile schools	Total
Higher-performing	4 (9%)	14 (33%)	6 (40%)	24
Mid-performing	25 (56%)	18 (43%)	8 (53%)	51
Lower-performing	16 (35%)	10 (24%)	1 (7%)	27
Total	45	42	15	102

Schools in the middle and low decile bands were, however, most likely to be improving and schools with high deciles were least likely, as Table 5 indicates. When the performance levels of *Improving Schools* were examined, however, it was schools in the mid- and higher-performing groups that were most likely to be on an upward trajectory, rather than the lower-performing schools.

Table 5 Improving Schools by Performance Levels and Decile Band (N = 102)

	<i>n</i> (%) of low (1–3) decile schools	<i>n</i> (%) of middle (4–7) decile schools	<i>n</i> (%) of high (8–10) decile schools	% of performance groups that are improving
Higher-performing	1 (7%)	9 (18%)	0	37%
Mid-performing	8 (57%)	9 (18%)	2 (100%)	37%
Lower-performing	5 (36%)	2 (10%)	0	26%
Total	14	20	2	35%
% of decile band that are improving	31%	51%	13%	

Sample schools (N = 30)

When the performance of schools within the research sample was examined in relation to the deciles, a similar picture emerged for low and high decile schools (see Table 6). That is, low decile schools were the majority in the lower-performing category (4/6), but low decile schools were also the majority in the mid-performing band (7/17). High decile schools were relatively evenly spread between the mid- and higher-performing categories. Schools in the middle decile category, however, were not as evenly spread across the performance categories as they were with the full sample of 102. Middle decile schools were mostly mid-performing.

Table 6 School Performance by Decile Band (N = 30)

	<i>n</i> Lower-performing	<i>n</i> Mid-performing	<i>n</i> Higher-performing
High decile	1	4	4
Middle decile	1	6	2
Low decile	4	7	1
Total <i>n</i> and % for decile group	6 (20%)	17 (57%)	7 (23%)
Total <i>n</i> and % of performance band that are improving	1 (17%)	8 (47%)	3 (43%)

Nine of the thirty schools (30%) within the sample were initially identified as lower-performing by the benchmark method, five by the second indicator, and five by the third. Five schools (17%) were identified as lower-performing by two indicators, and one school (3%) was identified as lower-performing by all three indicators. Ten schools were initially identified as higher-performing by the benchmark indicator, and eight by both the second and the third value-added indicators. Three schools (10%) were categorised as higher-performing by two indicators and four schools (13%) were identified as higher-performing by all three indicators. Eight of the 12 (66%) low decile schools were either mid- or higher-performing and eight out of nine (almost 90%) of both middle and high decile schools were either mid- or higher-performing perhaps reflecting that schools that are performing well are more likely to opt into research that involves an analysis of school performance.

Improving Schools

As argued earlier in this chapter it is important to recognise not just higher-performing schools, but also schools that are improving, as gaining improvement is the challenge for principals particularly if their schools are not already higher-performing. It is at this point that the minimum credits criteria played an important role. As reported by Hipkins, Vaughan, Beals, and Ferral (2004), some schools began to realise the importance of carefully monitoring the uptake of the minimum credits only after some students failed to gain a qualification due to a lack of one or two of these prerequisite credits in the early years of NCEA. Thus, schools that adapted to the NCEA system are likely to have monitored the uptake of these credits more carefully as time has gone by. Schools that are improving, then, are likely to show it not only by the improved uptake in NCEA 1 to 3 qualifications, but also by the improved percentages of students gaining these minimum credits.

As Table 7 shows a high proportion of the schools in the sample were categorised as *Improving Schools*; 13 out of 30 (36%). In this sample of 30, the pattern of results was similar to that of the 102 schools in that improving schools were most likely to be already mid- or higher-performing and mainly low and middle decile schools as Table 7 shows. Half of the low decile schools were categorised as improving schools as were about half of middle decile schools, but only two out of nine high decile schools were categorised in this way, providing more evidence that higher-performing schools perhaps suffer from a ceiling effect with many unable to improve greatly but already higher-performing.

Table 7 Number of Improving Schools by Decile Band

	Improving Schools (n)	Other Schools (n)
High decile	2	7
Middle decile	5	4
Low decile	6	6
Total	13	17

Table 8 shows the sample schools' final classification by the rules method and demonstrates how improving schools were most likely to be currently mid-performing and least likely to be lower-performing.

Table 8 Sample Schools' Final Categorisation by the Rules Method

Lower-performing	Mid-performing	Higher-performing
School A	School B	School J
School C	School D	School N
School E (improving)	School F	School O (improving)
School G	School H (improving)	School V (improving)
School AA	School I	School X (improving)
School AB	School K (improving)	School Y
	School L	School Z
	School M (improving)	
	School P (improving)	
	School Q (improving)	
	School R (improving)	
	School S (improving)	
	School T	
	School U	
	School W (improving)	
	School AC	
	School AD (improving)	
6	17	7

Discussion

The rules method was favoured over the purely numerical Method 2. Method 2 was a simple aggregation of results without the use of rules. Whilst appearing to provide certainty as a purely numerical system, a simple numerical system such as Method 2 can be readily skewed by the type of data included. For example, if the benchmark data were excluded, lower-decile schools would be favoured. If the improving data were included, schools maintaining a high performance level would be disadvantaged. If alternative data providing two points for very high performance (e.g., over 85% pass rates) in three levels of NCEA over four years were included, higher-decile schools would be favoured. In fact, such an indicator was developed but ultimately not used for the very reasons being outlined here.

By using the rules described in this chapter, it can be seen that either system of aggregating this data produces a somewhat similar result. Having the improving classification as an alternative higher-performing category mitigates against the risks of missing the identification of a very good school performance because of the phase of development the school is in.

The rules method, as described here, was an attempt to make judgements on relative school performance more reliable by using different indicators, using data for four years of results in most cases, and by cross-checking with another method of data-aggregation. When schools are difficult to categorise and at the margins of performance categories, it seems reasonable to ask such questions as the following: Has the school managed the basics of helping students gain the minimum literacy and numeracy credits and Level 1 NCEA? If the school has room to improve, is it doing so? Is the school assisting students to gain high qualifications? The method described here has built that cross-checking into a set of rules.

NCEA data appears to be at least as reliable as data typically used in other countries to investigate the relationship of school performance with the instructional leadership of principals (Shulruf, et al., 2008). A school's results are dependent to some extent on the prior performance and motivation of the students attending the school. If students have come to have a low estimation of their ability or begin their secondary school years with lower achievement, they are less likely to engage with the schooling

or NCEA system. A report by Meyer and colleagues (2006) on student motivation under the NCEA system indicated that those students with a low estimation of their own ability and therefore low motivation, were more likely to be in decile 1 and 2 schools. Both home and previous school environments may have contributed to that self-perception and level of performance. While the home and community environment can be accounted for to some degree by the two value-added indicators, the performance of the contributing schools cannot. By measuring four different cohorts and by recognising the *Improving Schools* status as being an important and positive indicator, it is thought that this weakness associated with prior student performance is mitigated.

Nevertheless, the very nature of the students themselves may cause variation in results that are not recognised by these indicators. For example, some schools may have disproportionate numbers of students with special needs because the school caters for them well, but success with this group of students may not be apparent in NCEA data and count against the school being categorised as higher-performing.

Nor does the method recognise students gaining qualifications at year levels other than what we would call the *expected level* i.e. NCEA Level 1 at Year 11, Level 2 at Year 12, and so on. Thus, a school would get no credit for having students in Year 12 gain their NCEA Level 1 (or Year 11 students gain Level 2 credits), and yet that may be a very good outcome for both the student and the school. A follow up to this thesis will use school leaver data to address this shortcoming. This method will then take into account all students who leave school with a qualification regardless of the year level in which it was obtained.

Equally, the method of data analysis used in this study does not recognise the success of schools that help students into other pathways such as apprenticeships, or into jobs. For some students, this may be an indication of school success with a student. The method of data analysis favours academic results over those that may be harder to quantify but equally important. Neither do these indicators recognise other forms of success such as attracting and retaining students who may be difficult to engage. For some students, just getting them to attend school may be a huge achievement. In other words, it is not

all about the teaching—it is also about the nature of the students. The use of multiple rules and the recognition of improvement mitigates this criticism to some degree.

These rules cannot take into account the different courses offered and assessment practices used at schools. The management of the curriculum at schools can be expected to vary greatly according to, for example, the size of the student body, the nature of the community, the expertise of the staff and the expectations of the leadership. It was clear from the ERO reports that School AB offered almost all unit standards, while School U offered mainly achievement standards. It could be argued though that neither school did service to their student body by using a rigid approach to what is meant to be a flexible system. Nevertheless, some schools will offer courses that are deemed harder to pass than other schools' courses (which may be the case with School U). So even if students were from similar communities, it could be harder to gain qualifications in one of the schools due to the types of courses offered.

Other variations with courses could affect results also. For example, if a secondary school has a small number of students, it will have few teachers and only be able to offer a limited number of courses. This could be a disadvantage or advantage for students depending on school practices. A well-managed and well-staffed small secondary school could offer a limited number of boutique-type courses to suit the students. But if it was in a remote location, and found it hard to gain any staff, it may only be able to offer what the staff at the school can deliver. In other words, when it is difficult to gain staff the programme may have to be constructed around the knowledge and interests of the teachers rather than those of the students.

Some schools may also offer Cambridge International examinations or International Baccalaureate, and numerous students may not enter the NCEA examinations. This could skew results if the students did not also sit NCEA. Thus, numerous variations of courses offered by schools could impact on results.

It is accepted that it is difficult to calculate data that does justice to real life situations, but making some type of categorisation (e.g., higher-performing and improving schools) is a necessity of this type of research where it is intended to judge the impact of school leadership. Categorising performance by any

means is potentially contentious, but numerous strengths of using the type of analysis suggested here can be identified.

First, indications are that the results in NCEA are becoming more reliable. In the earlier discussion, it was pointed out that moderation of assessments was not so strong in the early years of NCEA leading to some mistrust of results. Results in the future, however, can be expected to be more reliable because since 2008, increased and random moderation of internally assessed work has occurred and this will lead to more reliable NCEA results. This makes the ongoing analysis of school performance in this way, a potentially useful method of studying performance trends. Furthermore, by using a combination of indicators rather than one rank ordered list based on one indicator, the method developed here helps to establish whether a school has numerous similar indicators of performance.

While the rules method endeavoured to ensure that the difference in schools and the different populations they serve is recognised by using value-added indicators, it still recognises that a minimum gross productivity performance level is an important determinant of performance. Moreover, this method allows for the categorisation of improving schools, an important group if we consider the job of school leaders to improve outcomes for students regardless of a school's current performance or its socio-economic setting. This is particularly important for lower-performing schools that may be catering for less motivated students (Meyer et al., 2006; Thomas et al., 2007). The value these schools add for their students is acknowledged with the improving categorisation.

The rules method clearly indicates that high levels of school performance are not necessarily confined to higher decile schools. Some low decile schools perform at very high levels, even when gross productivity measures are used. The rules method's inclusion of the benchmark indicator acknowledges that high performance must be *high* in real terms for the sake of the students first of all, but also performance will be judged in those terms by the public regardless of efforts to show the value that has been added. The rules method brings the advantages of a value-added system to a ranking system of schools of similar type.

Another key advantage of this method of rules is that it provides a means by which the performance of schools can be compared over time, and may potentially be used to track New Zealand secondary schools' performance through periods of leadership change, and allow more to be revealed about the relationship between principal instructional leadership and school performance. While this rule-based method of treating school performance data, as for any system, will not perfectly replicate reality or provide total certainty about the relative performance of schools, it is argued that it is a better system than one that is purely numerical such as Method 2.

The results of the sample of 30 schools produced a relatively high number that were categorised as higher-performing (7/30) or improving (13/30). This could be the result of self-selection. Schools that feel they are doing well may be more likely to be involved in research that links school performance and principal instructional leadership.

The *Improving Schools* category was dominated by schools that were mid- or higher-performing already, and was more likely to include low and middle decile schools (11 out of 21) than high decile schools (2 out of 9). It appears then that those with most room to improve (lower-performing) are not necessarily doing so, or that the results of their efforts are not yet shown in the data. High decile schools were least likely to be improving, perhaps due to a ceiling effect with the higher gross levels of performance.

Whilst lower-performing schools were still more likely to be low decile, the three schools that were categorised as higher-performing and improving (V, X, and O), were all low or middle decile schools. Surprisingly, only one lower-performing school was showing an improving trend (School E), with 9 of the 17 schools in the mid-performing group on an upward trajectory and almost half of the higher-performing schools (3 out of 7) also still improving. This contradicts Thomas and colleague's (2007) finding that lower-performing schools were more likely to be improving when using value-added data, but once again confirms the pattern found with the 102 schools—lower-performing schools were the least likely to be improving. This is more consistent with the findings of Gray and colleagues (1996). They found, (albeit with a small sample also), that more of the lower-performing schools were improving more slowly than other schools.

As with the sample of 102 schools, both the lower-performing and mid-performing groups were dominated by low decile schools, and the higher-performing category was dominated by high decile schools. In the sample of 30, four of the six lower-performing schools were low-decile and only one of the six was improving, perhaps reflecting the considerable challenges of changing a school culture when performance levels are poor. Gaining a mandate for change in either high or low SES environments may be difficult, but for different reasons. In a high decile environment, the school may be perceived to be doing well when it is not, and in a low decile environment a school may be excused for its poor results. The data presented here, while only a very small sample, indicates that neither high decile nor low decile schools are immune from low performance levels, and that schools regardless of their socio-economic status may both improve results and perform highly. It appears that some schools in the lower- and mid-performing groups are capable of producing better results than they are, but have not been able to realise the opportunities provided by NCEA to improve learning outcomes for all students and overall school performance.

In some cases, this may well be more a matter of school philosophy regarding NCEA than poor leadership per se, however, it may still be disadvantaging students who are capable of gaining a qualification. Decisions about the type of courses that are offered, the type of standards that are used, the monitoring systems used for uptake of credits, and the use of reassessment opportunities, can all impact on the reported levels of school performance. For example, if a principal's philosophy is that all subjects should be academic in nature and that unit standards should not be used, then students with ambitions that are other than academic may be severely disadvantaged and struggle to gain a qualification. If some of those students had been able to opt for courses aligned to their interests (e.g., in hospitality, or motor mechanics), they may well be more motivated to succeed in their academic subjects as well. Thus, the philosophy and values of the principal are likely to impact on their decision making and ultimately impact on learners.

Conclusion

The method developed and used for this study is more defensible than a pure *gross productivity* or *league table* type of measure in that it uses the raw school performance data in a variety of ways to assess the amount of value added by the school, and allows both the comparison of schools against a

benchmark and comparison against schools of similar type. The rules method recognises schools that are improving outcomes for all students, and outcomes for Māori students in particular, but recognises that very high-performing schools may not have room to improve—maintaining standards is their constant challenge and some dip in performance may be inevitable at times. The combination of the results of these various analyses produces a simple but reasonable estimate of schools that are higher- or lower-performing given the student body that is taught, and provides some simple rules for guidance in making judgements about the relative performance of schools, particularly those at the margins of these groups.

Two major advantages of this system of analysis are evident. First, the method can use any number of indicators and was only limited here by the amount of data publicly available. Having said that, it is probably important not to have too complex a system of rules but the addition of retention rates of students, for example, could be useful data to add to the mix, as could the performance of Māori and Pasifika overall. Equally, this system could be applied to the primary school system if data were available by using indicators of mathematics and reading achievement, for example, and ranking schools on these outcomes and tracking which schools improved over time and which needed to be supported to improve. Second, this system could provide a method of tracking the performance of schools in relation to changes in principals over time. This would allow added insights into the impact of the instructional leadership of principals in schools.

Chapter 3: Principal Instructional Leadership in Secondary Schools— Literature Review

I now turn to the literature relating to the instructional leadership of secondary principals. At first glance, the evidence from quantitative and qualitative sources tends to be somewhat contradictory. On one hand, qualitative evidence tends to suggest that principals can be very effective, such as when case studies describe principals who turn around schools (Chenoweth, 2007). Quantitative assessments, on the other hand, have suggested small, indirect effects with the goal orientation of the principal being the strongest source of leadership influence (Hallinger & Heck, 1998). More recent quantitative evidence, however, has suggested a range of effects from weak to strong for differing instructional leadership behaviours, with particularly strong effects for professional learning and development but still significant, though smaller effects for indirect instructional leadership (Robinson, et al., 2008).

I have already argued (in Chapter 1) that instructional leadership needs to be thought of as both instructionally focused (direct) and managerially focused (indirect) to support instruction. This terminology was used by Kleine-Kracht (1993) who referred to these sets of behaviours suggesting that both impact on the quality of instruction. Whereas, direct instructional leadership was the “immediate interactions of principals with teachers and others about the classroom, teaching, student performance, and curricula” (Kleine-Kracht, 1993, p. 188), indirect instructional leadership was referred to as “behaviours that deal with the school’s internal and external environment, the physical and cultural context surrounding the classroom, teaching and curricula, and the meanings that principals’ actions have for teachers” (p. 189).

The question I raised in Chapter 1 was: Are we getting an accurate assessment of the instructional leadership of secondary principals? I argued that indirect instructional leadership was not often measured, and questioned whether items that are appropriate for the secondary school setting are frequently included in measurement tools. I also argued that most research on instructional leadership has been carried out in primary school settings, and some researchers have warned against generalising these results to the secondary school setting for this very reason—items may not be appropriate (Bossert, et al., 1982; Firestone & Herriott, 1982; Hallinger & Murphy, 1987; Leithwood, 1994). When studies are set in secondary schools, results often indicate lower levels of instructional leadership on the

part of the principal (Heck, 1992; Marks & Louis, 1999; Smith & Andrews, 1989) and less effects on outcomes (Brown, 2001), or, of equal concern, very little difference between the behaviour of principals in higher- and lower-performing secondary schools (Heck, 1992; Smith & Andrews, 1989; Witziers, Bosker, & Kruger, 2003). So how effective secondary principals can be, is somewhat uncertain due to the relative dearth of research in secondary school settings and the nature of some of the measurement items. If more appropriate behaviours were measured and their impact assessed in a secondary school environment, what results could we expect? The literature regarding secondary principals' enactment of instructional leadership and their degree of effectiveness is now examined in order to answer the following questions:

1. How do secondary school principals enact their instructional leadership? (Is it different from that of primary school principals? What behaviours do they typically carry out?)
2. How much impact do secondary school principals have on school performance?
3. How do secondary school principals improve outcomes?

Two general criteria guided the choice of studies used to answer these questions. First, quantitative evidence and case studies had to focus specifically on the secondary school. Studies that did not distinguish between school levels (i.e., primary and secondary) in their results were usually not used or were referred to only in passing. Second, the quantitative studies used in the second section had to link principal leadership with academic outcomes. Given an exhaustive search of such studies was recently carried out by Robinson and colleagues (2008), their list of studies was used as a starting point. Other search techniques included use of the ERIC database and searching reference lists of any relevant articles. Ultimately, only eight studies were found that met the criteria and one of these (Hofman, Hofman, & Guldmond, 2001) involved the leadership team including the principal, as opposed to investigating behaviours of the principal alone. It was retained as a core piece of evidence in the second section because of its relevance to findings reported in Chapter 5. Qualitative evidence about principals' leadership in secondary schools was more prevalent. The articles referenced here are not intended to be representative of all such case study research, but were selected due to their focus on specific behaviours of secondary principals.

The review first covers some background information on quantitative methods of assessing principal instructional leadership. Then it draws on a broad set of evidence to build a case about the nature of principal instructional leadership in secondary schools. In the second section, the impact of principal instructional leadership is investigated using eight quantitative studies that report effects in secondary schools, and these are then compared to results from meta-analyses. In the third section, largely case study evidence about the behaviours that principals use to improve performance is given consideration in the light of the quantitative evidence. This latter section is organised around the five dimensions of instructional leadership identified by Robinson and colleagues (2008) and two additional dimensions (*Problem solving* and *Developing a sense of collective responsibility*) because these form the basis of the survey that is described in Chapter 4.

The Theoretical Framework

Before referring to evidence about how principals impact on school performance, some background on quantitative research needs to be outlined so that studies using this type of methodology can be better assessed. Hallinger and Heck (1996) outlined three major theoretical models that are used in quantitative research to assess how principal instructional leadership impacts on school performance. The first was a direct effects model that suggested that principal leadership directly affects outcomes. The results from most of these studies indicated no effects on student outcomes. The second was a mediated effects model that hypothesised that principals affected outcomes through intervening variables such as other people, organisational frameworks, practices within the school, and school climate or culture. These latter studies usually did show an impact on student achievement. The third theoretical model was the reciprocal effects model that proposed that principal leadership not only impacts on outcomes, but that some variables can in turn impact on the principal's leadership. "A reciprocal effects framework implies that administrators adapt to the organization in which they work, changing their thinking and behaviour over time" (Hallinger & Heck, 1998, pp. 167-168). In other words, it is not just the principal's impact on a school that needs to be considered, but also the school's impact on the principal. Thus, context may impact on what behaviours a principal is able to perform and what behaviours are appropriate to perform (Hoy, et al., 1998).

While this is an attractive theory, the major shortcoming of using a reciprocal model is that longitudinal studies involving changes in principalship are required to truly test it (Hallinger & Heck, 1998). The mediated effects theory of principal leadership (e.g., via organisational or cultural features) is the path model that is more often utilised as a theoretical model (e.g., Alig-Mielcarek & Hoy, 2005; Hallinger & Heck, 1998; Heck & Moriyama, 2010) and such theories are helping to shed light on how principal leadership works. Hallinger and Heck (1998) suggested that researchers should be paying more attention to testing intervening variables such as school culture even if the more elaborate reciprocal effects model cannot be tested with the resources available to a researcher. While accepting that a reciprocal effects model is perhaps a closer approximation to ‘reality’, this advice resulted in the following model being adopted for investigation (see Figure 2). It is a model that suggests school culture is the key mediator of principal instructional leadership (Hallinger & Heck, 1998), an assumption frequently made by researchers (e.g., Louis & Wahlstrom, 2011; Sammons, et al., 1997). In this case, culture is conceptualised as teachers’ attitudes and beliefs about themselves, their colleagues, and the wider leadership team in relation to students and their work with students.

Figure 2 Theoretical Framework for Conceptualising Principal Instructional Leadership

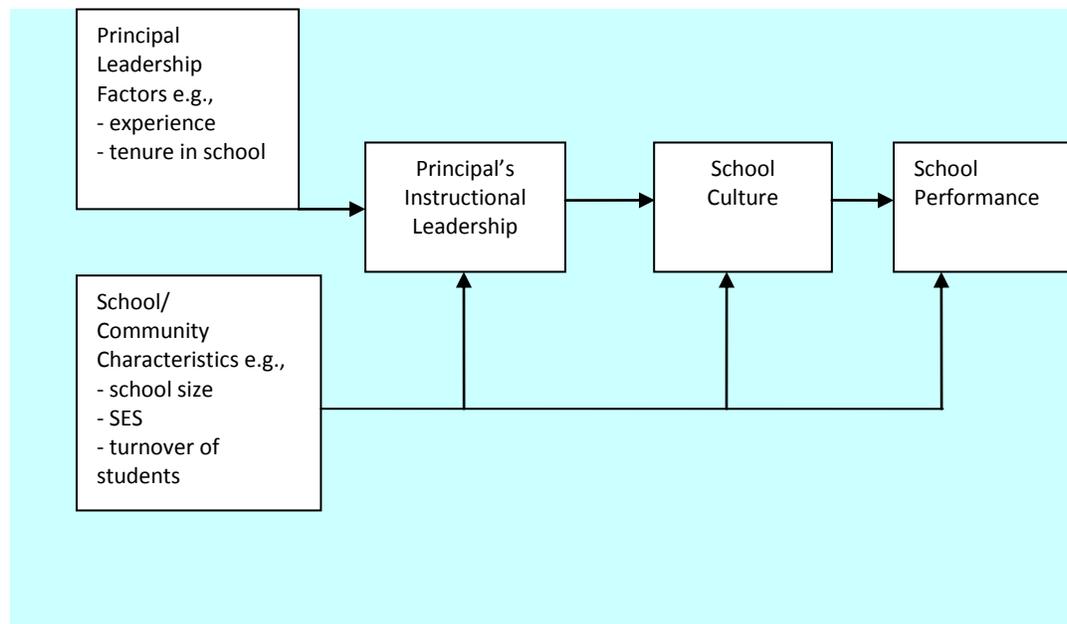


Figure 2 depicts principals’ instructional leadership as being impacted on by their own knowledge, experience, and skills, and by the characteristics of the community in which they work (antecedent variables). The instructional leadership of the principal (independent variable) impacts on the culture of

the school (mediating variable), and through that, the school's performance (outcome variable). Community and school factors are also theorised as impacting on the principal's instructional leadership, the school culture, and school performance independently. So, for example, one can imagine a very poor community impacting on teacher efficacy, and thus impacting on school culture. The adoption of this model of instructional leadership suggests that the culture of the school should be a focus of investigation as well as principal instructional leadership. This was an important conclusion affecting the design of the teacher survey (described in Chapter 4).

School Culture

The principal is frequently depicted as the culture builder in a school (e.g., Halverson, 2007; Louis, Kruse, & Raywid, 1996; Louis & Miles, 1990; Marcoulides & Heck, 1993; Witziers, et al., 2003). Unfortunately, research involving the concept of culture is hindered somewhat by the lack of a common definition of the term (Bossert, et al., 1982). This impedes the ability to gain empirical evidence of a link between principal behaviour and culture. Certainly, recent effective schools literature (e.g., Fullan, 2006b; Little, 2002; Louis & Wahlstrom, 2011; McLaughlin & Talbert, 2007; Schmoker, 2006) has been consistent in arguing that leaders who understand and help transform the culture of a school are required to improve outcomes in schools. For example, Louis and Wahlstrom (2011) concluded from their research involving 8000 secondary principals and teachers in the United States that: "A typical school's organizational culture often gets in the way of change" (p. 53), and that schools with "stronger cultures are more adaptable, have higher member motivation and commitment, are more cooperative and better able to resolve conflicts, have greater capacity for innovation, and are more effective in achieving their goals" (p. 52).

Similarly, Newmann and Wehlage (1995) showed that schools in the United States with features of Professional Learning Communities (PLCs) produced higher gain scores regardless of the socio-economic status of the community. PLCs are usually defined as having cultural characteristics such as: a shared purpose, teachers who collaborate for that purpose, teachers who meet regularly to build capacity, leaders who use data to monitor effectiveness of teaching, and teachers who take collective responsibility for the outcomes of all students (DuFour, Eaker, & Dufour, 2005). In other words, PLCs describe a type of school culture that appears to be an enabling factor for schools trying to improve outcomes. The emphasis is on teachers inquiring into, and reflecting on their own practice, and taking

responsibility for the outcomes students attain, as opposed to attributing any lack of success to home background. This is highly consistent with very recent evidence that suggests effective schools engage in a deliberate cycle of inquiry into which actions are impacting positively on student outcomes (Timperley, Wilson, Barrar, & Fung, 2007). Schools that display these qualities of inquiry and collaboration are likely to be highly focused on attaining or maintaining high standards, and to have teachers across the organisation sharing instructional leadership roles.

The principal's role in developing PLCs is not so clear cut. A PLC is not a programme that is implemented, but rather a culture that develops as a school grows depth and breadth of instructional leadership. How a principal nurtures this then, is of considerable importance. DuFour, Eaker, and Dufour (2005) stated: "To become a professional learning community, a school must transcend its dependence on a single leader and develop a culture that sustains improvement despite the departure of key individuals" (p. 24). Effective principals, it seems, can contribute to the development of PLCs by empowering teachers to lead and by fostering their leadership.

This theme of empowering others is prevalent in case studies where schools are 'turned around'. Chenoweth (2007), for example, described how a principal in the United States made use of a teacher as the instructional leader of the school to model lessons, mentor teachers, and maintain contact with individual students. Foster's (2004) Canadian case studies also described this strategy of developing and encouraging teacher leadership of the curriculum by effective principals. Again, this latter study emphasised the principal's role as one of mentoring and role modelling. Three Canadian secondary school case studies by Fullan and Newton (1988) also reinforced the shared nature of curriculum leadership in effective secondary schools. Thus, the role of the secondary principal in developing this type of culture may be to foster the direct instructional leadership of others.

Secondary principals, however, can face numerous challenges, some of them unique to their sector, when attempting to develop such a culture. If culture is to be equated with teacher attitudes and behaviours as it is here, we need to understand what factors may impact on these. Influences that have been shown to be associated with secondary school teachers' attitudes include the age of the teachers,

the length of time they have been in a school, the practices that have developed in a school over time, and the reform efforts or policies of the country in which they work (Hargreaves & Goodson, 2006).

Teachers are heavily influenced by the era they trained in and the departments they work in (Hargreaves & Goodson, 2006; Siskin, 1994). Hargreaves and Goodson (2006) noted from their extensive interviews with 200 secondary teachers in Canada and the United States whose careers had spanned through the 1970s, 80s, and 90s, that: "Teachers accept or resist particular reforms according to the correspondence or not of the reforms with their generational missions, their academic subject orientations and commitments, and their school's identity" (p. 15). For example, teachers who started working in the 1970s were more likely to welcome social justice changes in schooling as were teachers "in guidance, special educational, and minority subjects" (Hargreaves & Goodson, 2006, p. 15). Depending on the teachers' philosophy of education, their teacher training era, and their level of adoption of numerous social and educational changes, teachers displayed varying attitudes to students, learning, and the school.

Hargreaves and Goodson's study also showed that the length of time teachers had been in the school impacted on culture. Teachers frequently stayed for long periods of time in secondary schools, and as such were the maintainers of a culture. They saw numerous principals come and go quite quickly as these leaders sought promotion. The result, however, was that any innovations brought by one principal quickly dropped away with leadership change unless internal succession occurred. While recent evidence suggests that the turnover of New Zealand principals in secondary schools is reasonably low with approximately 10% changeover each year (or about 33 schools based on 2008-2009 data) (Wylie, 2010), the long service and stability of staffing in secondary schools is, at least anecdotally, still a factor that results in enduring cultures in secondary schools.

So it can be seen that the role of principal in developing culture is not clear cut. The teachers are likely to carry the school's culture over time with the attitudes of groups of teachers from earlier eras having a stronger impact than the principal, at least initially, so long as their numbers are dominant. Certainly, Schein (2004) suggested that culture is not something that can be changed as such, but a leader can influence it. Culture is deeply embedded in organisations: role modelling, new staff appointments, the

establishment of new routines, the manner in which leaders deal with problems, and how they allocate resources, all impact on culture—but it takes time. While it is easy to aspire to the development of PLCs, this may be a major challenge for principals in some schools depending on the stage of development of the organisation and the mix of people on the staff.

How do Secondary Principals Enact their Instructional Leadership?

In addition to the challenges previously set out, the secondary environment presents some specific challenges that separate it from its primary school equivalent (Firestone & Herriott, 1982; Heck, 1992, 1993; Leithwood, 1994; Siskin, 1994). Commonly cited differences relate to the size of the school, the effects of departmentalisation, and the nature of adolescents, all of which impact on the type of instructional leadership that a principal can carry out.

First, the typical size of the school makes the secondary principal's role one more of coordination and interpersonal influence, and less of direct instructional leadership (Blank, 1987; Firestone & Herriott, 1982; Hallinger & Murphy, 1987). The principal in the secondary context is by necessity removed from the individual teacher, and reliant on working through hierarchies of middle managers (Hallinger & Murphy, 1987; Siskin, 1994). Good systems and procedures can pull these departments together and make the school more effective (Hargreaves & Goodson, 2006; Rutter, et al., 1979; Siskin, 1994).

One historical study that provides evidence about how effective procedures contribute to an orderly and effective learning environment is that of Rutter, Maughan, Mortimore, and Ouston (1979). These authors investigated how schools serving similar intakes of students in inner London suburbs produced different outcomes for the students. They:

found that after adjusting for intake characteristics, children at the most successful school got an average of four times as many exam passes as children at the least successful school. Also, children in the bottom 25% of verbal ability in the most successful school on average obtained as many exam passes as children in the top 25% of verbal ability at the least successful school (Good & Brophy, 1986, pp. 571-572).

Rutter and colleagues (1979) concluded that the overall school culture or ethos resulted from the amalgamation of many small items of organisation. They used observers in classrooms to rate such teacher behaviours as time spent on the lesson versus set-up and administration time, amount of praise, amount of work displayed on walls, amount of homework sent home, and degree of teacher checking of homework. They also checked other school variables such as the amount of graffiti in the school and the number of students who used the library. They found that discipline was better in schools that had a whole-school approach to managing student behaviour, where students were praised more often, and where students were more likely to discuss a problem with a teacher. Rutter and colleagues found that overall school processes and student behaviour were correlated at the 0.92 level, and overall school processes and attendance were correlated at the 0.65 level. Correlations between school processes and academic attainment and delinquency were 0.76 and 0.61, respectively. They concluded that student attitude and behaviour were “shaped and influenced by their experiences at school and, in particular, by the qualities of the school as a social institution” (Rutter, et al., 1979, p. 179). The implication of this research was that the tone of a school is enhanced by many organisational practices being implemented well.

Obviously, the principal, as the person with the positional power in the school, has the responsibility for ensuring the organisational elements function well and effectively support the delivery of the curriculum. It has been suggested that to impact on culture, one first has to impact on behaviour (Schein, 2004; Shook, 2010). This theory is well aligned to Rutter and colleague’s conclusion that a principal can influence the culture by impacting on how the school functions and how problems are dealt with. The greater the size of the school, however, the more complex the hierarchies are likely to be, and the more removed the principal is likely to be from interacting directly with teachers (Firestone & Herriott, 1982). This makes the underlying systems of a secondary school an important influence on teacher attitude and behaviour when schools are large.

The departmentalisation of secondary schools is a second major difference that sets these schools apart from their primary school equivalents. In secondary schools, influence is not as centralised with the principal as it is in primary schools (Siskin, 1994). A secondary principal leads a staff of subject specialists instead of teachers joined by an emphasis on the ‘basics’ as in a primary school setting (Siskin, 1994).

Thus, the nature of the curriculum and its delivery differ greatly from that of the primary school and impact on the instructional role of the principal. Departmental heads take responsibility for overseeing the work of teachers, whilst the principal typically works through a hierarchy of middle managers including the heads of departments, deans, and deputies. As such, the secondary environment is typically regarded as loosely coupled (Herriott & Firestone, 1984; Weik, 1976) in that departments are likely to have diverse goals and differing instructional practices according to their disciplines (Siskin, 1994). This goal and curriculum diversity was exemplified in Herriott and Firestone's (1984) study of 111 primary and secondary schools in the United States that described how all 22 of the 'upper high schools' in the sample were differentiated from the primary schools by their low goal consensus and lower principal influence over curriculum and teaching.

Because of this diversity within and between departments, secondary schools can easily become balkanised and unconnected if they are not led purposefully by a principal with a whole-school agenda (Hofman, et al., 2001). Departments develop their own language and norms, and often have their own work spaces that help engender a specific culture as teachers interact (Siskin, 1994). Thus, teachers in different departments frequently form sub-cultures that can be difficult to influence (Hofman, et al., 2001; Rowan, et al., 1991; Siskin, 1994). Of course sub-cultures can just as readily exist in primary schools, but the usual organisational configuration of secondary schools, it seems, is susceptible to the development of somewhat disjointed sub-cultures. The ability of the secondary school principal to draw these departments and teachers with differing interests together, therefore, is a key instructional leadership skill (Bolam & Turner, 2003; Kerry, 2005; Little, 2002; Rowan, et al., 1991; Siskin, 1994).

A third challenge specific to secondary schools relates to the age and requirements of the students. Secondary schools have to have the right balance between a focus on orderliness and a focus on developing a curriculum that truly engages its adolescent students (Daniels, Bizar, & Zemelman, 2001; Lee, Bryk, & Smith, 1993). This relies on developing a curriculum well-matched to the needs and interests of the student body. In New Zealand, with NCEA (as was argued in Chapter 2), the scope for designing courses is far greater than it has been in the past, and the range of pathways to qualifications can be many and varied. Courses need to engage and motivate the students to experience success, and this in turn is likely to feed into further successes and enhance the orderliness of the environment and the overall performance of the school (Meyer, et al., 2006). Those schools that are effective tend to

focus not so much on discipline as on building an environment that is well managed with clear boundaries and expectations for both teachers and students to act respectfully (Chenoweth, 2007; Dinham, 2005; Firestone & Rosenblum, 1988; Lee, et al., 1993). The ability to develop a well-ordered environment and a relevant curriculum are, therefore, key responsibilities for the secondary principal (Blank, 1987; Firestone & Rosenblum, 1988; Murphy & Hallinger, 1985; Rutter, et al., 1979).

These three organisational features—size, departmentalisation, and the age and nature of the students, impact on the type of instructional leadership that a secondary school principal can carry out. The secondary school principal is less likely to be involved in direct interaction with the classroom teacher, and more likely to be focused on managing and coordinating the school than many of their primary school counterparts (Firestone & Rosenblum, 1988; Heck, 1992). Hallinger and Murphy (1987) argued that this was the case 25 years ago, but they also argued that this type of leadership can be effective:

There is evidence that strong administrative leadership does contribute to secondary school success. Instructional leadership in secondary schools may, however, differ in two related ways. First, secondary school principals do not rely on the same type of direct leadership activity utilized by their peers at the elementary level. In high schools, the larger staff and student populations, the multileveled organizational structure, and the specialized subject area knowledge of teachers all limit the principal's ability to be personally involved in all aspects of instructional management. Instead the principal must rely more on indirect, facilitative, and symbolic modes of expression, providing direct intervention in selected situations (p. 188).

Much of the modern research on the instructional leadership behaviour of secondary school principals has been carried out using a tool called the Principal Instructional Management Rating Scale (PIRMS) (Hallinger, 2005). This tool assesses a range of behaviour deemed to define instructional leadership, but does not assess many behaviours that are indirect or facilitative. As a result, little evidence can be produced of the effects of a broader range of principals' instructionally focused behaviours, and how or if they impact on educational results. Yet evidence suggests that indirect instructional leadership is the predominant behaviour by principals (Hipkins, 2004; Horng, Klasik, & Loeb, 2009), and therefore it is important to assess whether it is effective. Some of the empirical evidence suggesting that secondary

school principals largely use indirect instructional leadership is now described before assessing the effectiveness of these behaviours.

Descriptions of Secondary School Principal Leadership

The findings of a reliance on indirect instructional leadership in a secondary school setting are supported by several studies. Krajewski (1978) carried out a survey of 127 secondary school principals in the United States and found that the roles principals played were not necessarily the ones they wanted to enact. *Instructional supervisor* was the task they rated most highly with *Curriculum supervisor* second (both direct behaviours), but their ranking of their actual behaviour suggested they spent most time on *School program administrator/materials, facilities*, followed by *Disciplinarian* (indirect behaviours). Krajewski concluded, as Kleine-Kracht was to 15 years later, that the secondary principal's role was one that was largely facilitative.

Kleine-Kracht's (1993) case study described a secondary school principal in the United States who purposefully utilised indirect behaviours to enhance achievement. This principal did a lot of decision-making himself, empowered his heads of departments to make decisions (e.g., on teacher appointments), and managed the "nuts and bolts" of the school. The principal had a focus on communicating and managing the context for learning. Kleine-Kracht concluded that the popular tendency to focus on the direct instructional leadership role of the principal may need to be tempered with an understanding that the principal may be effective as the facilitator of others' instructional leadership.

Again, in a study of 32 secondary schools in the United States, Blank (1987) found that principals' direct instructional leadership was rated lowly by teachers, and involvement in creating an orderly environment was rated most highly. Only 3 of the 32 principals in this study were rated highly on *Deciding on the curriculum*. The highest means (out of five) were 4.3 for *Increasing academic learning time* (this was a district policy direction for all schools to follow) and 4.2 for *Exercising authority on student behaviour rules*. The lowest mean was for *Deciding on curriculum*, an indicator of *Instructional improvement and innovation*, with a mean of 1.7. We can see that in this case principals were rated high for involvement in creating an orderly environment, an example of indirect instructional leadership, but

very low on indicators of their involvement with the curriculum—a direct instructional leadership behaviour.

Rossmiller (1992) also found in his sample of eight secondary principals in the United States that they paid little attention to instruction because they were involved in other matters most of the day. Nearly all of the administrators spent part of their day engaging in telephone or face-to-face discussions with parents, and trying to protect teachers from external pressures. All of these principals had suffered some legal dispute with parents within a year of the study, suggesting a major distraction from their desired instructional focus. Overall, it can be seen that this evidence suggests that principals spend little time on direct instructional leadership activities. This conclusion is supported by time-use studies.

A United States study that took a mixed approach using observations and interviews in five secondary schools was carried out by Martin and Willower (1981). This study found principals spent most of their time on unscheduled meetings (27.5%) and dealing with discipline (23.8%)—so about 50% of their time was spent on administration and management activities. They also spent 15% of their time on extra-curricular activity, and about 17% on instructional matters. In this study, the principals were largely inwardly focused on the school with an emphasis on interpersonal, informational, and decision-making roles.

While these results are somewhat dated now, more recent results from New Zealand are very similar. In a 2003 survey (Hipkins, 2004), 200 New Zealand secondary school principals reported spending most of their time on activities that could be called administrative (29%), and on managing staff (22%), so again around 50% on administration and management. Just as Martin and Willower (1981) had found, these principals reported spending about 17% of their time on direct instructional leadership.

Finally, very recent evidence to support this claim that secondary principals spend very little time on direct instructional leadership comes from a working paper by Horng and colleagues (2009). This research involved all 41 secondary schools in Miami-Dade County in the United States consisting of 65 schools in total. The principals were shadowed and their behaviours noted every five minutes for a week. The researchers used strict time-use data collection methods to ensure reliability. They reported

that the secondary principals in their sample spent most of their day on administrative tasks (27% of their day), and organisation and management activities such as managing budgets or staff (21%)—again, note the approximation to 50% on administration and management. They spent 15% of their day on internal relations, 8% on external relations, only 6% on day-to-day instructional tasks (e.g., visiting classrooms), and a further 7% on matters to do with the general instructional programme, so about 13% in all on direct instructional leadership. Much of the remaining time went into transitioning between tasks. Notably though, principals spent most of their day in their offices (56%), and when they did go into the classroom it was usually related to administration.

In summary, the small amount of time spent directly on instructional matters makes it even more germane to establish the amount of instructional leadership going on via management and administration type activities and how effective it is. Having said that, I am not suggesting that all administration and management activity is instructional leadership, but, as argued in Chapter 1, when a principal facilitates the instructional leadership of others or organises the school so that instruction is more effective, these activities must be considered instructional leadership.

Primary and Secondary School Comparisons

The weight of evidence to date then has pointed to about 13% to 17% of principals' time being spent on direct instructional activity with about 50% spent on administrative and management functions and the rest on internal and external relations. When schooling at the differing levels is compared, secondary school principals are consistently rated as using less direct instructional leadership than their primary counterparts. Smith and Andrews (1989) presented evidence that the average principal, (based on a sample of 1,006), spent 27% of their time on educational improvement efforts. Then, 21 'strong' principals, 11 from primary and 10 from junior and senior high schools, were identified who had scored at least one standard deviation above the average principal on a measure of instructional leadership. These strong secondary principals spent less time on instructional improvement (direct instructional leadership) than their strong primary school counterparts (33% compared to 49%). Strong secondary school principals carried out more direct instructional leadership than the average principal, but it was less than the strong primary school principal. These levels of direct instructional leadership were higher than those just cited in the previous section. Nonetheless, Table 9 shows that the key difference between strong secondary school principals and strong primary school principals in this case, was that

secondary principals spent more time on *Building management* (management and administrative duties), and less on *Educational program improvement* (direct instructional leadership).

Table 9 Strong Primary and Secondary Principal Behaviours (Smith & Andrews, 1989)

Job Dimensions	% of time for strong primary school principals (N=11)	% of time for strong secondary school principals (N=10)
Educational program improvement	49	33
School community relations	8	8
Student related services and activity	20	21
Building management and operations/district relations	23	38
Average hours per day	10.7	10.8

Another study that provided evidence of primary and secondary comparisons of principal instructional leadership is that of Heck (1992). His research involved Californian schools that consistently performed above or below expected levels compared to schools of similar type over three consecutive years. Four teachers from each school provided feedback on their principals. The sample included 15 high achieving and 8 low achieving primary schools, and 7 high achieving and 10 low achieving secondary schools. Primary school principals were scored higher by teachers than secondary school principals on all but one leadership task regardless of their school achievement levels. The one item on which secondary principals were rated marginally higher than primary school principals related to ensuring an orderly environment. High achieving secondary school principals scored an average of 4.2 for “Minimizes classroom interruptions so teachers can teach”, while high achieving primary school principals scored an average of 4.1. Further, principals in low achieving primary schools, on all but one item (“Protects faculty from external pressure”), scored equal or higher than principals in high achieving secondary schools.

More recent results from a larger sample were supplied by Horng et al. (2009). When their results from primary and secondary school principals were disaggregated by school level, it was the similarity between secondary and primary time-use that was highlighted. Both groups of principals spent around 46 to 47% of their time on behaviours categorised as *Administration* and on *Organization and management*, and about 7% on *Instructional program*. The areas of greatest difference were in *Day-to-*

day instruction where primary school principals spent 10% of their day and secondary school principals spent 6%. The other point of difference was in time spent on *Internal relations* and *External relations*. Both groups of principals spent about 22% of their time on relationship management, with the majority internally focused, but secondary school principals spent proportionally more time on external relations—about 8% of their time compared to 5% for primary school principals. These more recent results indicated less difference between the two groups of principals than earlier research, perhaps indicating shifts in the primary school principal's role over the last 25 years. Where there were differences in favour of the primary school principal, it was in the level of direct instructional leadership and the amount of time taken in maintaining internal relationships. The secondary school principal was more externally focused, but about the same amount of time was spent on *Administration*, and *Organization and management*—about half (46% for primary and 48% for secondary school principals).

The weight of evidence suggests then, that a largely indirect leadership role of managing the instructional environment may be typical of a secondary school principal—and perhaps of most principals these days. Secondary school principals, however, appear to carry out less direct instructional leadership than primary school principals, and may possibly spend more time on administration and management activities or external relationships. This raises an important question. Given the large amount of time spent on these managerial type behaviours, and the indirect nature of much of their leadership, what impact do these behaviours by secondary school principals have on school performance?

How Much Impact do Secondary School Principals have on School Performance?

Overall, the evidence of effectiveness is difficult to synthesise due to the scarcity of quantitative evidence in secondary settings, the various ways instructional leadership is conceptualised in research, and the lack of evidence about the effectiveness of various indirect behaviours in a secondary setting. These issues were discussed in the introductory chapter. I now describe the results of meta-analyses and quantitative studies set in secondary schools that investigate principal behaviour and its relationship with school performance.

The meta-analyses of two researchers provided some indication of comparative results between primary and secondary school principal leadership. Brown (2001), reported in an unpublished PhD study, that primary school principals' effects on outcomes were far greater overall than secondary school principals' effects ($d = 0.75$ compared to $d = 0.44$). His study drew on numerous unpublished PhDs, but also on several peer-reviewed studies that will be referred to here in more detail (Blank, 1987; Heck, 1992; Hoy, Tarter, & Bliss, 1990) but only six secondary studies in total. In Brown's meta-analysis, *Instructional organization* had the strongest effect when all studies (primary and secondary) were analysed ($d = 0.66$). Leadership that focused on the school's *Mission* had weaker effects ($d = 0.22$) as did *School climate* ($d = 0.29$). Regrettably, for relevance to this thesis, individual dimensions were not disaggregated by school level so secondary-specific detail cannot be reported here.

Nevertheless, Brown did report individual effect sizes of 0.44 for what he called *Instructional organization* (direct instructional leadership) in the Hoy, Tarter, and Bliss (1990) study (a mediated effects study), and 0.43 (compared to 1.10 for primary school principals) for Heck's secondary school results which was a mediated effects study with antecedents, but only 0.28 from the study by Blank (1987) which was a direct effects study with antecedents. Thus, as Hallinger and Heck (1996) concluded, these mediated effects studies tended to provide evidence of "statistically significant indirect effects" (1996, p. 38), and certainly stronger effects than reported from direct effects research in these studies using secondary school samples.

Other meta-analyses by Witziers and colleagues (2003) suggested smaller effect sizes for principal behaviours. Consistent with numerous other studies (Hallinger & Heck, 1998), though not Brown's, these researchers found *Defining and communicating mission* to have the largest effects (ranging from 0.30 to 0.38) but found that "...in three out of nine cases, secondary schools produced significantly lower effect sizes than those conducted in primary schools" (1998, p. 412). Other behaviours by the principal such as *Supervising and evaluating*, *Monitoring*, and *Visibility* had maximum effect sizes of 0.20. Summing up, reports of effect sizes vary, but effects from about 0.20 to 0.40 are typically reported for direct instructional leadership behaviours in secondary schools.

I now turn to eight individual studies in secondary schools that make links between the instructional leadership of the principals and student outcomes. Studies that did not differentiate between settings, (e.g., Heck, Larsen, & Marcoulides, 1990; Heck, Marcoulides, & Lang, 1991; Horng, et al., 2009; Marks & Printy, 2003), did not assess the link to student achievement (e.g., Cheng, 1991), or reported on only one dimension of leadership (e.g., Verona & Young, 2001) could not be used as evidence about the effects of differing principal instructional leadership behaviours in secondary schools.

Table 10 summarises the information from the eight quantitative studies. Four were conducted in the United States, two in Singapore, and one each in Israel and the Netherlands. The studies varied in sample size, study design, and measures of leadership and school performance, as did the results. Some trends are evident however, particularly when the other quantitative and qualitative evidence about how principals can improve school performance is added to this core set of results in the next section.

Table 10 Quantitative Studies of the Effect of Principal Leadership on Secondary Student Outcomes

Reference	Schools	Data Sources on Leadership	Leadership Measures	Measure of Student Outcomes	Results
Blank, 1987; USA.	32 high schools; 2 randomly selected from each of 16 cities.	Interview of Heads of English and math, and one teacher in each subject.	Ratings of six areas of leadership: instructional improvement and innovation; educational goal consensus; staff development; seeking district or community support/resources; involving staff in planning; exercising authority with issues of school policy and organisation.	Up to 20 different national standardised tests used by sample schools. Decile rank of school for average test score of school's 10th graders on a) reading and b) mathematics achievement. Schools average percent daily attendance.	Behaviours associated with maths achievement but not reading achievement that were significant were: effective decisions on curriculum and increasing academic learning time, both indicators of instructional improvement and innovation. 78% of principals involved in deciding rules for student behaviour. Only

					3/32 or 9% rated strongly on making decisions on the curriculum.
Brewer, 1993; USA.	Representative national sample of 1,100 high schools.	Administrator and teacher survey, and self survey by principal.	Principal ranking of academic excellence; instructional leadership conceptualised as principal degree of influence over a) instructional methods and b) curriculum content.	Gain scores of individual students over a 2 year period on test of verbal and quantitative ability administered as part of national US survey.	Principal time in current school, in teaching or administration had no effect on achievement and nor did teacher experience Significant at .05 level, size of school and % of teachers appointed by principals with high academic goals and principal influence over instructional methods.
Gaziel, 2007; Israel.	32 secondary schools randomly selected from 4 districts.	8 teachers in each school.	36 item instructional leadership scale (adapted from Hallinger, 1983).	Matriculation exam results in mathematics, English, and Hebrew.	Multiple regression showed only size of school, SES, and Goals had significant effect on achievement.
Heck, 1992; USA.	23 primary schools (15 high achieving and 8 low achieving) and 17 high schools (7 high achieving and 10 low achieving).	Principal and 6 teachers in each school.	Survey of three domains of instructional leadership: - governing the schools -developing school climate - organising and monitoring instructional programme.	12th grade reading, mathematics and language scores on California Assessment Program.	Classroom observations differentiated between higher- and lower-performing primary but not secondary. Protecting faculty from external pressure (a difference of .5 on a 1-5 scale) and emphasising test results (.3) were largest

					differentiators between higher- and lower-performing secondary. Strong primary principals' instructional leadership rated much higher (.4 to 1.1 greater) than all others.
Heck, 1993; Singapore.	Convenience sample of 26 high schools.	6 randomly selected teachers in each school.	Three aspects of principal leadership: school decision making processes; communication and relationships; instructional organisation.	National test on a variety of curriculum areas.	Used discriminant factor analysis. Found size (.64), school type (.61), and teacher expectations (-.57) and teacher experience (.37) strongest predictors of performance. Principal problem solving used as indicator of culture. In low achieving school, teachers less likely to approach principal with problems and have less positive attitude towards students.
Heck & Marcoulides, 1996; Singapore	Convenience sample of 26 high schools.	6 randomly selected teachers in each school.	Transformational leadership measured including resource availability, responsiveness to teachers' problems, and visionary and collaborative leadership.	National test on a variety of curriculum areas.	Managerial processes related to organisational climate (.46), which was related to teacher attitudes (.63). Teacher attitudes related to school

					performance (.52).
Hofman, Hofman, & Guldemond, 2001; Netherlands.	Representative sample of 91 secondary schools	Principals and department heads.	Measured six types of co-ordination, then derived through cluster analyses, 3 different management configurations.	National standardised math test at end of the third high school year.	13% of schools found to have cohesive, proactive, 'tightly linked' environments associated with high performance.
Hoy, Tartar, & Bliss, 1990; USA	58 high schools in one state.	Random sets of teachers from each school.	a) Principal supportiveness and directiveness b) Principal influence, academic emphasis, consideration, initiating structure, and resource support.	Reading and math achievement, New Jersey HSPT.	SES and <i>Academic emphasis</i> related to performance. Academic emphasis made up of orderly environment and goal setting type items (e.g., high expectations). Strategic resourcing type items also significantly correlated with school performance. Protecting teachers from pressure negatively correlated.

Culture

Several of the eight studies referred to the importance of developing appropriate teacher attitudes or school cultures; that is, cultures that have strong academic goals and a *press for achievement*. For example, Heck (1993), found that teachers in low achieving schools could be distinguished from those in average and high achieving schools by their "less favourable attitudes about children's academic ability" (p. 159). School culture (as measured by teachers' views of teacher attitudes and behaviours) was negatively associated with performance indicating that where school performance was low, teacher attitudes were less positive about the ability of students and about the ability of the principal to communicate vision and be supportive. Heck (1993) stated that:

The results of this study are generally supportive of those that have found a non-chance relationship between the classroom behavior and attitudes of teachers; how the principal is perceived to monitor and contribute to important in-school processes, such as governance, school climate/culture, and instructional organization; and performance outcomes (p. 162).

Thus, the role of the principal and the attitudes of staff are intertwined, and much of those attitudes or school culture may be shaped by the “in-school processes” that were referred to earlier as being key to leading successfully in large and departmentalised secondary schools (Rutter, et al., 1979). Further evidence of this link between processes, culture, and performance comes from Heck and Marcoulides (1996), who tested “a structural model of organizational culture adapted to an educational setting” (p. 80). Reporting in terms of standardised path coefficients, they found managerial processes were related to organisational climate (.46), which in turn was related to teacher attitudes (.63), and through these attitudes to school performance (.52). Communication channels were found to be particularly important and schools that were less bureaucratic were thought by teachers to have better climates (-0.19). In summary, these researchers found that “an organization’s culture is reflected in what is done, how it is done, and who is involved in the processes” (Heck & Marcoulides, 1996, p. 93). Thus, the evidence also suggests that teacher attitudes, are (to some degree at least), affected by these processes, and impact on performance.

While culture and the organisational frameworks of schools can be linked to outcomes, the degree of harmony within a school is not necessarily a good indicator of school effectiveness. Hoy, Tartar, and Bliss (1990) found that indicators of *Teacher intimacy* (personal friendliness) and *Teacher engagement* (support for each other) were not significant contributors to achievement. It is not enough to have a warm and supportive adult culture—a press for achievement must be pervasive if improvement is to result and effective structures must underpin the press for achievement.

How many secondary schools display the characteristics of positive school cultures that press for achievement is open to debate, but Hofman, Hofman, and Guldemond (2001) found only 13% of secondary schools in their Netherlands sample were bound by the cohesive (“tightly linked”) and

proactive environments that they found to be effective. Using mathematics results as the outcome variable, these researchers found schools were more effective when the different layers of management were involved in decision making. These researchers concluded that effective secondary schools were focused on outcomes, and cohesive despite their departmentalisation:

In effective secondary schools the school head and the departments collaborate and, by doing so, they reinforce a type of school with tightly interdependent and mutually supportive elements resulting in a reinforcing management style that includes positive socially cohesive instruction together with an academic-oriented climate (p. 131).

The effective schools had a high level of cohesion and direction not just on educational matters, but also with regard to finances and personnel. The implication was that the sharing of decision making across the leadership team and a proactive team approach to goal achievement had a positive impact on school performance. The picture that is developing from this quantitative evidence continues to suggest, as argued in the first section, that positive school cultures are built on good systems and transparent decision making procedures, along with good collective team work by the senior (deputies) and middle (heads of departments) leadership teams.

Direct Instructional Leadership

The question remains, nonetheless, as to how principals can nurture such a culture. Behaviour that has an academic goal focus is most commonly cited as the strongest principal influence on culture and performance (Hallinger & Heck, 1998). For instance, Hoy, Tartar, and Bliss (1990) using regression analysis, found *Academic emphasis* ($\beta = .29, p < .05$) had a significant effect on achievement. The researchers concluded that “the academic emphasis of the school makes a significant contribution to the explanation of student achievement that goes beyond the influence of SES” (p. 273).

Similarly, in Gaziel’s (2007) study, out of four behaviours, only *Framing goals and communicating to staff* was significant when regression analysis was carried out on student achievement ($\beta = 0.15, p < .05$). Using multiple regression that carried forward factors that had significant correlations, Gaziel found that “49% (Adjusted R^2) of the variance on achievement was explained. However, only SES, school size,

framing goals, and communicating to staff appeared to have a significant impact on student achievement” (p. 22). He did not find a significant relationship between principals’ ratings on *Supervising and evaluating instruction*, *Monitoring student performance*, or *Coordinating the curriculum* (all direct instructional leadership behaviours) and achievement. Gaziol commented that this lack of significance for direct instructional leadership is not the common result, and queried whether the explanation for no significant effect in his sample was related to context. It is suggested here that this is the case. That is, in secondary schools, principals may be replaced by deputies and heads of departments who carry out most of the in-class observations and roles directly related to monitoring classroom practice. As we have seen, effective secondary schools appear to use distributed instructional leadership well.

Overall, this quantitative evidence suggests then, that secondary school principals do not have a strong role in direct instructional leadership—they are more likely to work through others. But three direct instructional behaviours were highlighted by this secondary-specific evidence. Blank (1987) found only 3 of the 32 principals in his sample took a lead role in *Deciding on the curriculum*, but this was one of two behaviours “positively associated with mathematics achievement” (p. 77) ($F = 6.15, p < .05$). Notably however, about half of the 32 schools spent less than 20% of their meeting time on curriculum matters. Nevertheless, this evidence suggests that those secondary school principals that can use educational expertise to make sound decisions about the shape and nature of the curriculum are likely to have an impact on student outcomes. The second direct instructional leadership item that distinguished between higher- and lower-performing secondary schools came from Heck’s (1992) study. The item *Emphasizes test results for program improvement* differentiated between both higher- and lower-performing secondary schools and primary schools (by 0.3 and by 0.4 respectively). These items again suggest the importance of the principal creating a culture of academic press, regardless of the school sector. The third direct instructional leadership behaviour that was found to be significant was the *Principal’s influence over instructional methods* (Brewer, 1993), but results were not significant when the principal’s influence over curriculum content was assessed. Brewer suggested that this latter behaviour was probably not the domain of the principal in secondary schools. This conclusion is consistent with my overall argument that it is the head of department who takes on this role.

The same explanation is relevant to other behaviours typically considered the role of the principal in primary schools. For example, having the principal actively monitor teaching practice is often cited as

effective when primary schools are the subject of research (e.g., Alig-Mielcarek & Hoy, 2005; Wellisch, et al., 1978), but Heck (1992) found that the mean scores of principals in both lower- and higher-performing secondary schools on the item *Makes regular classroom visits* did not discriminate between the groups of secondary schools. They both rated a mean score of 3.1, whereas principals in higher-performing primary schools gained a mean score of 4.2, 0.8 more than the principals in lower-performing primary schools. Not surprisingly, Heck (1992) found that higher-performing secondary schools were more difficult to predict from the principal's instructional leadership than higher-performing primary schools because of the lack of differentiation on many of the indicators. I am suggesting that some of this may be due to the type of instructional leadership behaviours that are measured, many of which would be carried out by heads of departments and deputies in a secondary school setting.

We can conclude from all of these studies (Blank, 1987; Brewer, 1993; Heck, 1992) that having an academic emphasis and influencing the nature of the curriculum are important direct instructional leadership behaviours for a secondary school principal just as they are for a primary school principal. Behaviours such as observing teachers in the classroom and directly monitoring student progress were not significant behaviours for secondary school principals, though they may be for other leaders in the secondary school, just as they were for the primary school principals in Heck's (1992) study. Much of the secondary school principal's role involves facilitating the direct instructional leadership of others, as their schools are usually so large as to demand this type of response.

Few findings pertaining to the principal's role in professional development were reported in these studies to compare to Robinson and colleague's (2008) finding of a large effect size of 0.84. Blank (1987) found that a minority of principals (28%) took a leadership role in staff development and Gaziel (2007) did not find *Promotes teachers' professional development* to be significant. The other quantitative studies cited here did not report on specific professional development items.

Indirect Instructional Leadership

Evidence on indirect instructional leadership from these eight quantitative studies involved items pertaining to strategic resourcing, creating an orderly environment, and problem solving. Two studies

referred to strategic resourcing. Brewer (1993) found that the greater the percentage of teachers appointed by principals with high academic goals, the higher the gain scores and the greater percentage of teachers appointed by principals with low academic goals, the lower the gain scores. It was not just the principals' goal-setting that contributed to effectiveness, but also their ability to recruit teachers with high goals and thereby impact on the culture of the school. Thus, when routine behaviours (such as hiring a teacher) are performed with a strong academic press, they can be educationally powerful. Brewer's study indicates how important managerial-type decisions are when they are aligned to academic goals (in this case, resourcing strategically by hiring quality teachers).

Another study that indicated the effectiveness of strategic resourcing was that of Hoy, Tartar, and Bliss (1990). Using regression analysis, they found evidence of material resource allocation having a significant effect on achievement ($r = .33, p < .01$). No further evidence to support the importance of strategic resourcing was found in these studies, but much of the evidence from the eight studies suggested the importance of maintaining an orderly environment in various ways.

Four of these studies provided evidence of the effectiveness of ensuring an orderly environment. Blank's (1987) study indicated that *Increasing academic learning time* ($F = 6.15, p < .05$) was associated with mathematics achievement. Twenty-eight out of 32 principals had a lead role in ensuring that academic learning time was increased, though, notably, this was a district policy that principals were complying with—and it appears, an effective one. It is another good example of how indirect instructional leadership can impact on outcomes because the behaviour is strongly goal oriented. Increasing academic learning time is a simple (and apparently effective) organisational goal that can be supported with managerial processes and clear communication by the principal and leadership team.

Similarly, Heck (1992) found the item *Protects faculty from external pressures* to be the most discriminatory item with a mean rating of 3.2 in low achieving secondary schools and 3.7 in high achieving secondary schools. These findings indicated that where staff members felt protected from external pressure and supported in their teaching role, results were better. Results from Hoy, Tarter, and Bliss (1990), however, suggested that the opposite was true—parental pressure, while not enjoyed by teachers, had a positive effect. Both may be right—parental pressure may impact positively on

teaching performance up to a point, but teachers may perform better if protected from extreme parental pressure.

A principal can also help create a sense of orderliness by resolving problems and conflicts. Heck (1993) found that lower achieving schools were associated with less teacher satisfaction over their ability to approach the principal with problems. Staff in high achieving schools rated their principals highly on their ability to solve problems and on the communication and social relationships within the school. Items used to measure this included: *Principal behavior toward staff is supportive and encouraging* and *Teachers approach principal with problems they have*.

In summary, the instructional leadership behaviours that appear most strongly supported as effective in secondary schools from these eight studies are those relating to press for achievement or academic goal orientation (Gaziel, 2007; Heck, 1992; Hofman, et al., 2001; Hoy, et al., 1990), creating a sense of orderliness by protecting or increasing academic learning time, resolving teacher issues and protecting them from unreasonable external pressure (Blank, 1987; Heck, 1992, 1993), strategic resourcing (Brewer, 1993; Hoy, et al., 1990), and making sound decisions about the nature of the curriculum and instructional methods (Blank, 1987; Brewer, 1993).

Antecedent Effects on Principal Instructional Leadership

The eight studies also contain some evidence of the antecedent effects that were referred to as part of the model of instructional leadership that I put forward in Figure 2. Of the eight quantitative studies already cited, Gaziel (2007) and Hoy and colleagues (1990) both indicated links between socio-economic factors and instructional leadership.

SES

An interesting finding by Hoy, Tarter, and Bliss (1990), was a negative relationship between *Institutional integrity*—the ability of a school to maintain the “educational integrity of its programs” (p. 264) and *Academic achievement* ($r = -.34, p < .01$). The authors suggested that some of this effect may relate to SES, with wealthier parents in relatively high-performing schools applying unwelcome pressure on

teachers. These researchers also indicated that there was more academic emphasis in high SES schools and principals were less direct in their instructional leadership than in lower SES schools:

Teachers perceive more pressure and intrusion from the community in schools where students achieve at higher levels. That is, the higher the academic achievement of the high school, the more likely teachers view the parents as a source of trouble. Parents in wealthier school districts may be more aggressive and, perhaps, more involved than are parents in districts of lesser means, an interpretation supported by the strong, positive correlation between academic emphasis and SES, as well as by the moderate, negative correlation between principal directedness and SES ($r = -.20, p < .05$) (Hoy, et al., 1990, p. 270).

In support of the finding that principals in lower SES areas may have a more direct role in instructional leadership, Blank (1987) also found principals in lower SES areas were reported as providing “a greater degree of leadership in instructional innovation” than others (p. 76). Blank went on to say:

One possible explanation for this difference is that schools, and districts, with more low income students may be placing greater emphasis on the role of the principal in instructional leadership as a strategy for academic improvement (1987, p. 76).

Thus, principals in high SES areas may use less direct instructional leadership perhaps because they do not have to be so directly involved. Teachers in these schools may feel more parental pressure to meet expectations that students will be successful. But in low SES areas principals may need to take a more direct instructional leadership role to overcome lower teacher expectations and possibly less parental pressure on teachers.

Certainly, Louis and Wahlstrom (2011) reported that schools in high SES areas were “less likely to have principals whose leadership was associated with energetic efforts to make change” (p. 56), and Lee and Smith (1996) also found that the higher the SES, the higher the collective responsibility for student outcomes, while teachers in low SES areas were more likely to attribute student learning to factors

other than themselves. These results indicate that a principal in a lower SES area may have to work hard to change teacher attitudes and expectations particularly where a long cycle of poor student performance and low teacher efficacy has taken hold. The effects of parents, communities, prior levels of learning, and expectations by a range of people—the students themselves, their teachers, and their parents, can all be expected to impact on the response required of a principal and can create a variety of situation-specific challenges. Thus, it seems reasonable to conclude that schools in low SES areas or schools with lower achievement levels may require more direct instructional leadership by the principal than others (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Firestone & Rosenblum, 1988).

School Size

Numerous researchers have also argued that improving outcomes in secondary schools relies on being able to work constructively with others and that this is more likely to occur in smaller schools. For instance, Lee and Smith (1996) found that smaller secondary schools (not clearly defined) were related to gains in mathematics ($d = -0.47, p < .05$), reading ($d = -0.20, p < .05$), history ($d = -0.15, p < .05$), and science ($d = -0.15, p < .05$) scores. These authors suggested that this was because teachers in small schools are more readily able to develop a sense of collective responsibility which they found to be strongly related to academic outcomes.

Gaziel (2007), however, found school size to be positively related to school achievement ($r = .36; p < .05$) but when describing the size of schools stated “The smaller schools enrol between 400 and 600 students and the bigger schools up to 600 students” (p. 19), making interpretation of these results difficult. Brewer (1993) also found school size to be positively related to outcomes indicating that larger secondary schools benefited students, but again, it is difficult to determine what is considered large or small in this study. Similarly, Heck (1993) reported positive associations between school size and performance in his Singaporean sample, but Rutter and colleagues (1979) found no such relationship in their study of 12 London secondary schools though obviously, this was a small sample of schools.

Therefore, results are not consistent and size of school may well be related to SES effects in some countries. Hattie (2009b) concluded from his meta-analysis that secondary schools with between 600 and 900 students may optimise learning because the size of the school allows a solid core curriculum to

be offered, and yet is not so large that principals and staff cannot get to know their students well. In support of this, Daniels and colleagues (2001) suggested that small schools do not have the range of electives which are often another form of streaming students away from more academic options—a finding also supported by the latest PISA (Programme for International Student Assessment) results (Organisation for Economic Co-operation and Development, 2010). This report stated that:

Systems that show high performance and an equitable distribution of learning outcomes tend to be comprehensive, requiring teachers and schools to embrace diverse student populations through personalised educational pathways. In contrast, school systems that assume that students have different destinations with different expectations and differentiation in terms of how they are placed in schools, classes and grades often show less equitable outcomes without an overall performance advantage (Organisation for Economic Co-operation and Development, 2010, p. 15).

Thus, size may be an enabler or a barrier for school leaders trying to promote a healthy academic climate and is, therefore, useful data to collect when analysing school effects and principals' instructional leadership.

Teacher Experience

Some evidence also suggests that the more experienced teachers are, the better their results. If true, this would indicate that principals would be wise to ensure that their recruitment policies ensure they have a core of more experienced teachers. Results from the eight quantitative studies focused on here are not so conclusive. Heck (1993) found teacher years of experience to be negatively related to performance, while Gaziel (2007) found that more experienced teachers were positively correlated with better examination results in English and mathematics over two years. Other researchers may well argue that teaching is more to do with expertise than experience. It is, however, beyond the scope of this study to examine the expertise and direct actions of the teachers in the schools whereas the experience level of teachers within schools is more readily assessed and may be one indicator of teacher knowledge, but perhaps not a strong one.

Principal Characteristics

It also seems reasonable to ask whether a principal with higher qualifications, more teaching experience, and more administrative experience (e.g., as deputy principal or head of department) is likely to be more knowledgeable and therefore more effective than novices with little theoretical or practical experience as a principal. Data on levels of experience in teaching and administration, and levels of qualification can be used as proxies for these characteristics in quantitative research.

Unfortunately, there does not appear to be a great deal of evidence investigating these independent variables along with indicators of school performance in secondary schools. Brewer (1993) found neither the principals' experience in teaching nor administration to be significantly correlated to achievement. The direct effects model that was used in this research, however, indicates that caution may be required in interpreting results (Hallinger & Heck, 1996). Nevertheless, Heck and Marcoulides (1996) also found no evidence of relationships between background factors such as gender, teaching experience, or academic background despite their study using a mediated effects model. No other relevant evidence was produced in the eight secondary school studies. The paucity and inconclusiveness of research relating to proxies for knowledge and skill levels on the part of the principal and their relationship to school performance, indicates that this would also be useful data to gather.

To sum up this section, I have briefly reviewed evidence relating to antecedent variables that may impact on school performance and affect the instructional leadership response of a secondary school principal. Little consistent evidence was found that relates variables to school performance beyond SES and teacher attitudes. I have also suggested that teacher attitudes may differ according to the community in which teachers work (SES) or the department they work in, and these may also impact on their view of the principal and of the school's performance.

Earlier, I argued that instructional leadership for secondary school principals may need to be re-defined. Secondary school principals may carry out less direct instructional leadership at the individual teacher level than a typical primary school principal (Firestone & Herriott, 1982; Heck, 1992; Horng, et al., 2009; Smith & Andrews, 1989; Witziers, et al., 2003) but their influence may need to be assessed in new ways to truly capture the effect of their principalship. Indirect behaviours may be the tool that is more context-appropriate for a secondary school principal. Certainly, some of the evidence cited here links behaviours such as good teacher recruitment (Brewer, 1993), maintaining an orderly environment

(Blank, 1987; Heck, 1992, 1993), resourcing strategically (Hoy, et al., 1990), and creating cohesive and proactive learning environments (Hofman, et al., 2001) with better outcomes. These behaviours may be indirect instructional leadership, but they are still effective tools for the secondary school principal. Some direct instructional leadership behaviours also appear to be effective such as goal setting (Gaziel, 2007), emphasising test results (Heck, 1992), increasing academic learning time, making effective decisions on the curriculum (Blank, 1987), and influencing instructional methods (Brewer, 1993). Others, such as observing in classrooms, apparently, are not so effective for the secondary school principal as the primary school principal (Heck, 1992), or rather, may not be appropriate items to measure as indicators of principal instructional leadership when departmental heads could be expected to be the key instructional leader for a teacher (Siskin, 1994).

I have argued that some of the tools used to assess instructional leadership have restricted our understanding of the principal's instructional role and may not be providing as full a picture as is warranted. I now move to largely case study evidence from secondary schools to add to this limited quantitative evidence-base, and build a fuller picture about how principals in secondary schools may positively influence school performance. It is now argued, on the basis of a broad set of evidence, that principals have a power base sourced in their position, their interpersonal skills, and their educational expertise, that influences their decision making and allows them to impact on performance. Their decisions may be about instructional practices (direct instructional leadership) or about organisational practices that support teachers (indirect instructional leadership), but both can be effective in improving school performance.

How Can Secondary School Principals Improve School Performance?

What sets principals aside from other leaders within a school is that they have the positional power that goes with their responsibility for the school and this allows them to make many crucial decisions that affect the performance of the school. Decision making is fundamental to leadership, and impacts on the willingness of others in a large, complex organisation with numerous layers of leadership to follow the principal's lead (Mintzberg, 2009). If principals cannot command respect through the decisions they make and take staff with them, a strong goal emphasis by the principal may have little effect, because as

Fay (1987) argued, power is “fundamentally consensual” in a leadership-follower relationship (p. 121). He argued that positional power provides the right to set a direction but:

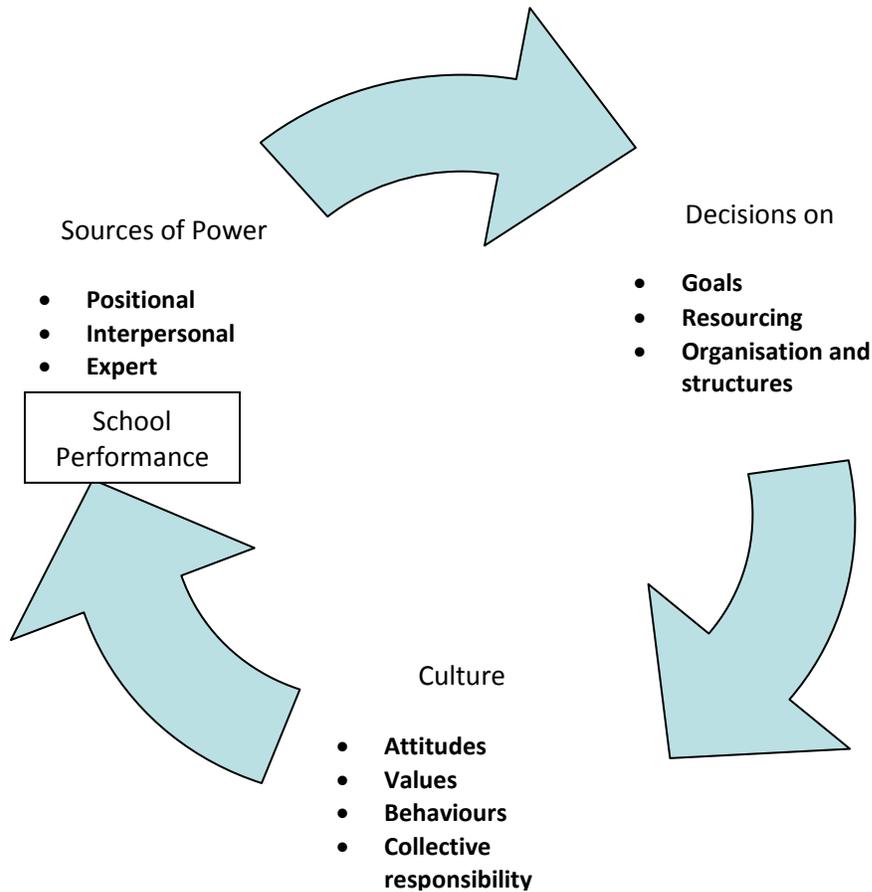
Leaders get others to act in a particular manner because followers agree to do what the leaders ask of them. This agreement may derive from the followers’ judgement that the leaders occupy a position which gives them the right to command a course of action, or that they possess the requisite personal characteristics of leaders, or that they seek an action which is correct or justifiable (p. 121).

Thus, Fay argued that followers agree to follow a leader not just due to the leader’s positional power, but also because followers want to follow due to their respect for the expertise and personal qualities of the leader. Principals, like all leaders, have to influence staff to work in certain ways. Both their interpersonal and ‘on-the-job’ competencies support them to exert this influence.

One way to gain staff support, or to “earn your leadership role” as Mintzberg (2009) would put it, is to win respect from good decision making. Consistent with this view and the arguments based on Fay’s (1987) work as detailed above, I theorised that principals have three key sources of power with which to influence teachers (see Figure 3).

First, their position allows them to make many decisions that impact on the effectiveness of the school. Second, leaders draw on their interpersonal skills to exert their influence (Mintzberg, 2009). Third, a leader’s degree of expertise (e.g., in management skills and curriculum) helps them to do this (Ogawa & Bossert, 1995). If teachers judge a principal to be competent, they are more likely to engage with the principal’s advice and directions (Bossert, et al., 1982; Louis & Wahlstrom, 2011). In summary, good decision making on the part of the principal can be linked to the development of teacher trust in the organisation—teachers will be more likely to go the extra mile for a principal they trust and respect due to the quality of the decisions and the methods utilised to make them.

Figure 3 Principals' Sources of Power to Influence School Culture and Performance



Decision Making

If reform is required to improve outcomes, then decisions about organisational changes have to be made that impact on both the structures within a school and the resulting culture (Heck & Marcoulides, 1996). I have already argued that structures, systems, and routines underpin effective instructional leadership. In a large organisation, decisions have to be made constantly about these structures and practices and, if executed well, they should support heads of departments and teachers to operate more consistently and effectively, and in line with a school-wide vision and goals (Mankins & Steele, 2006; Martin & Willower, 1981; Mintzberg & Westley, 2001).

Both the quality of the decisions, and the way decisions are made, appear to be critical in building a cohesive culture (Heck, 1993; Heck, et al., 1990; Marks & Louis, 1999). For example, a principal could be too cautious and not make decisions, allowing the status quo to prevail regardless. At the other extreme, a principal could be too reckless and not consider the disadvantages of decisions (such as not gaining the buy-in of staff), or may be unduly influenced by the opinion of others who have a stake in the outcome. Hammond, Keeney, and Raiffa (2006) argued “At every stage of the decision-making process, misperceptions, biases, and other tricks of the mind can influence the choices we make” (p. 126). The way a principal makes decisions and the quality of the decisions may impact on a principal’s ability to improve a school, because the quality of the decision-making and the way they make decisions sends signals to staff—these behaviours either enhance trust in the principal or impact negatively on the level of respect staff members have for a principal (Bryk & Schneider, 2002; Robinson, et al., 2008). This level of respect, in turn, impacts on the principal’s ability to lead the large and diverse teams that are typical of secondary schools.

One of the most critical decisions a principal must make is how much decision making to share with teachers and how to share it. A summary of teacher decision making research (Conley, 1991) pointed to a range of potential decisions teachers can be involved in, from technical to strategic, but highlighted a typical teacher-principal division. The principal usually develops policies and procedures with parental support, and teachers usually have more control over technical or classroom matters. At least two studies with mixed school samples (primary and secondary), pointed to the benefits of decisions being made by senior management but being informed by staff discussion and input (Heck, et al., 1990; Marks & Printy, 2003). Further secondary school evidence to support this stance came from Rossmiller’s (1992) case studies of eight secondary schools. Schools were viewed more positively to the degree that they involved teachers in decision making. This study showed that the ability to participate in decision making about discipline, professional development, and procedures, all enhanced teachers’ work life. Firestone and Rosenblum (1988) also found that teachers were not so interested in strategic matters but valued being involved in decisions that affected their day-to-day work such as those regarding student discipline and resource allocation.

These results all suggest that teachers who are involved in decision-making about matters of importance to them are likely to feel empowered and have more positive attitudes. Whether this makes the school

more effective is a moot point. That may depend more on the degree of goal orientation, but certainly involving teachers in decision making may help the principal to focus teachers on goals. If they are distracted by their dissatisfaction about basic organisational features, they are unlikely to want to engage in other agendas (Elmore, 2004).

One study indicated that teachers in secondary schools may have less involvement in decision making than their primary equivalents. Using a mixed school sample in the United States, Marks and Louis (1999) described the differences in teacher empowerment at three different levels of schooling: primary, middle, and secondary (eight of each). Teams of researchers observed for two weeks in each school and interviewed 25 to 30 staff per school. Results indicated that “overall teacher empowerment substantially supports organizational learning ($ES = .59, p \leq .001$)” (Marks & Louis, 1999, p. 726). These researchers argued that if schools are to be learning organisations, teachers have to have a voice in the decision-making. They noted that power can be held centrally, held by a few (e.g., the senior leadership team), or reside in disparate groups within a school, but learning occurs when teachers confront issues and are empowered to find solutions collectively. They also reported that primary school teachers were more empowered than both middle school and secondary school teachers. Seven of the eight secondary schools had low teacher empowerment scores.

But how much teacher involvement in decision making is the right amount? The longitudinal study by Rutter and colleagues (1979) in 12 London secondary schools indicated that decision making was most effective if decisions were made at the head of department or senior management levels as opposed to being made by the staff, but taking teacher opinion into account. In Kleine-Kracht's (1993) case study, the principal sometimes made decisions unilaterally and just got things done, but knew when to involve teachers. Other evidence suggested that too much teacher decision making can mean too many committees and too much teacher time taken up with these processes, thereby adding unnecessarily to workloads and impeding change efforts (Cheng, 1991; Hargreaves & Goodson, 2006). The principal's quandary is how to get the right balance between teacher involvement and top-down decisions. If they do, it appears that teachers may be more likely to have a positive attitude, and as has been shown, these attitudes can impact positively on student outcomes (Firestone & Rosenblum, 1988; Heck, 1993; Heck & Marcoulides, 1996).

In summary, whilst educational reform has a greater chance of success when teachers are involved in decision making, principals have the positional power to ensure this occurs. By gaining teacher buy-in through decisions on school organisational features that affect teachers' day-to-day work, they can also win teacher support for more ambitious attempts at educational reform. Good judgement is required, however, to get the balance right between too much and too little teacher involvement in decisions. Teachers like to be involved in decisions that directly impact on the classroom.

Strategic Resourcing: Staff Appointments

One of the most critical decisions a principal makes, is who to appoint as staff. This is a common theme in leadership and change research generally (e.g., Collins, 2001; Schein, 2004). As was seen in Brewer's (1993) study, secondary school principals with high goals tended to appoint teachers who shared those goals. In this way, over time, the dynamics or culture of a school can be changed to one of shared high expectations and accountability for results. This theoretical stance has gained strong support from case study research of schools that enjoy academic success despite challenging socio-economic circumstances. For example, Chenoweth (2007) reported higher-performing schools as being places where the principal "quickly got control of the supply issue" and hired "good teachers" (p. 65).

Of Chenoweth's two secondary school case studies, one described a principal who carefully vetted new teachers' pedagogical knowledge and skills as well as their attitudes, and if currently employed teachers were not showing the right attitude, the principal would assist them to 'move on'. The same theme was evident in Foster's (2004) two case studies of secondary school leadership. She stated that "Teachers who were resistant to change had retired or moved on" (2004, p. 42), suggesting some may have been encouraged to do so. Cheng (1991) also noted the importance of good recruitment outcomes in his two case studies as did Rossmiller (1992). Similarly, Dinham (2005) in case study research in 36 higher-performing Australian secondary schools, reported a pattern of schools attracting like-minded individuals to join the staff and thereby impacting on school culture. In the usually large setting of a secondary school, however, no principal can rely on shaping or improving the school culture merely by new appointments; it would take some time.

Strategic Resourcing: Resource Allocation

Resourcing allocation decisions appear to be another key tool with which a principal can influence staff attitudes and school performance. Bossert and colleagues (1982), in their literature review of the instructional management role of the principal, concluded that the principal's skill in managing resources results in staff respect (or not) and their consequent ability to influence staff in goal oriented behaviour. The principal has control of how much time teachers spend in meetings, how many financial resources their departments are allocated, how many classes a teacher teaches, and how much support is provided for their professional learning. Thus, resourcing decisions 'walk the talk' for a principal, and can either support the school's goals and help build a cohesive team, or fail to be aligned to the espoused academic goals of the school. In a similar vein, when describing principals of effective schools, Dinham (2005) stated:

These leaders are pragmatic. They know it is impossible to gain unanimous support, approval and commitment from staff. Rather than attempting to 'move' all staff simultaneously, they concentrate on those who are talented and committed and provide them with support (encouragement, time, resources, professional development). These 'pockets' of staff may be within faculties or across the school. They are encouraged and empowered by the principal, who may facilitate bringing like-minded staff together. There is a danger in this, in that some staff may be 'left behind' or be resentful and obstructive. As part of the risk taking approach, Principals believe that the 'contagion effects' of committed staff and demonstrated success will bring some—but probably not all—negative or reluctant people 'on-side' eventually (p. 352).

Nonetheless, other research indicated that different departments or groups of teachers within schools may have widely varying perceptions of a principal's effectiveness (Hargreaves & Goodson, 2006; Rowan, et al., 1991; Siskin, 1991). This could be the result of differing views of departments over whether they are privileged or deprived by the principal in terms of resourcing (Rowan, et al., 1991). For example, a principal with a subject affiliation could be viewed as favouring that department. Or a principal who is not supportive of a department could undermine its existence and thereby threaten staff and cause a reduction in trust. In support of this contention that fairness is important, Little (2002) concluded from case study research involving two secondary schools that:

To capitalize on the generative power of strong departments without breeding resentment and fostering conflict would require a strategy for resource allocation that could widely be deemed equitable, together with a mechanism for joining department-level interests and activities to compelling school-wide goals and problems (p. 712).

Further support for the importance of resourcing decisions by the principal as a means of influencing staff comes from Rossmiller's (1992) eight secondary school case studies where five factors that impacted positively on teachers' quality of work life were identified. The way they used their discretionary power over resources was one means of improving teacher work-life quality. Allocating resources strategically and being seen to be fair engenders respect and helps principals get teachers on-side in an improvement effort, a point also strongly made by Firestone and Rosenblum (1988) in their research on 10 secondary schools in challenging urban settings.

Positive inter-school relationships are not always a feature of improving schools but the focus on outcomes is. It would be surprising if all staff agreed with change efforts that impact on workload and practices. Effective change that affects classroom practice is likely to increase the number of problems encountered in a school and thus, to some extent relationship problems are likely if a principal is trying to gain improvements (Louis & Miles, 1991). Nevertheless, wise decision making about the allocation of resources can help support staff through change (Hargreaves & Goodson, 2006) and appears to be a feature of effective schools; one the principal is in charge of.

Ensuring an Orderly Environment

Improving schools also appear to be free from the chaos that can surround the struggling school (Elmore, 2004; Firestone & Rosenblum, 1988; Rutter, et al., 1979). Notably, both Elmore, and Firestone and Rosenblum, mentioned that improving schools are ones where 'the trains run on time', and point to principal leadership that ensures that the basics are done well. As already argued, the internal processes of the day-to-day management of a secondary school impact greatly on staff, and can be strongly influenced by decision-making at the principal and senior management team level (Bossert, et al., 1982). These decisions about school structures and routines can either support or detract from the school's goal-oriented efforts and influence teacher attitudes and behaviours and consequently, student

behaviour and academic performance (Bossert, et al., 1982; Dwyer, 1986; Heck, et al., 1990; Rossmiller, 1992; Rutter, et al., 1979; Timperley, et al., 2007).

As indicated earlier, another important element of effectiveness in secondary schools is team work. In semi-structured interviews with deputies and heads of departments, Sammons and colleagues (1997) found effectiveness related to positive departmental team work, and team work at the senior management team level. Less effective schools had less of a 'whole school' approach with, for example, overall goals and staff expectations. Less effective schools also tended to blame external factors rather than themselves, lacked consistency between departments, and often had less stable staffing or suffered from some sort of internal conflict. These findings are consistent with those of Hofman and colleagues (2001) cited earlier. In that case, effective and coordinated schools were in the minority (13%) but had well-coordinated, proactive senior leadership teams. In a similar vein, Dinham (2005) commented that:

The schools with outstanding sites tend to have a strong Executive structure with clear, well-understood responsibilities. Rather than being dictatorial or autocratic, Principals were seen to use these structures and responsibilities responsibly and effectively (p. 345).

It is self-evident, however, that leadership teams can just as readily put in place poor structures and routines that can impede the development of a learning community of teachers and "create inertia that deflects efforts to change" (Louis, et al., 1996, p. 10).

One of the key areas that must be attended to in a secondary setting is student discipline. Some research suggests that orderliness comes before academic success, though it is not sufficient in itself to guarantee good performance. For instance, Louis and Miles (1990) carried out five case studies in urban secondary schools. Two of the most successful schools started their improvement efforts by resolving short term issues first, such as improving discipline and reducing graffiti. These short term wins helped create the resolve to carry on the improvement effort. Direct attention to classroom teaching came later. The same observation was made by Dinham (2005)—the successful schools put a priority on cleanliness, orderliness, dealt with graffiti promptly, and developed an attractive environment that

helped to lift and maintain pride in the schools. An orderly environment, it seems, may be a prerequisite to improvement in school performance levels.

It is perhaps in Rossmiller's (1992) summary of case studies that the point about the importance of the principal's decision making in creating an orderly environment is best made. Rossmiller described teachers' frustration when "inconsistent or unpredictable disciplinary actions by the principal occurred", and principals' frustration "at the inability of some teachers to handle classroom discipline" (p. 141). Each school in this case study research had means of dealing with late students, and some had in-school disciplinary methods to manage student behaviour. The aim of each school was to create an environment where teachers could teach and students could be safe and learn, and this often involved the principal in face-to-face meetings with students and parents. This was an everyday occurrence for the principals who put a lot of effort into protecting teachers from external pressure.

Effective schools have an ethos that is purposeful and evident in the displays of work and behaviour of the students themselves regardless of socio-economic challenges (Chenoweth, 2007; Dinham, 2005; Muijs, Harris, Chapman, Stoll, & Russ, 2004; Rutter, et al., 1979). Chenoweth (2007) stated that higher-performing schools "do not spend a lot of time disciplining students, in the sense of punishing them" (p. 220). Higher-performing schools in challenging circumstances have programmes to encourage students to think about consequences of behaviour and "establish an atmosphere of respect. Students are treated with respect, teachers are treated with respect, and parents are treated with respect. For the most part, this starts with the principal..." (Chenoweth, 2007, p. 221).

Problem Solving

A principal's role as a problem solver can be important in gaining or maintaining an effective school culture also. As we have seen, Heck (1993) found teachers in less effective schools were more reluctant to approach the principal with a problem. Case studies also supported the finding that principals who are approachable and pragmatically focused on resolving issues and supporting teachers to work in a better environment, contribute to student achievement (Cheng, 1991; Dinham, 2005; Rossmiller, 1992). Rossmiller's (1992) summary of case studies, for example, highlighted how important the principal was in dealing with conflict and repairing relationships. Principals were frequently observed in a mediating

role—between parents and teachers, between teachers, or between groups of teachers or departments. The importance of the principal's role in maintaining high levels of communication and anticipating and heading off problems was a point strongly made in these case studies.

A different tack was taken by Louis and Miles (1991), who identified problem coping as a major determinant of success in schools undergoing improvement efforts. They found that aiming at student results directly did not have as much effect as aiming at it indirectly by, for example, focusing on classroom management or more time on task. These researchers concluded that problems were always present and planning didn't necessarily prevent them, but ultimately success depended on how the school coped with the problems. Further, consensus on improvement actions led to better coping strategies, though these researchers identified implementing changes to teaching practices as the most difficult change agenda to embark upon in secondary schools. These findings suggest that if principals want to improve performance, they may gain traction with short-term wins in areas such as student orderliness and on-task time in the first instance.

Problem solving regarding student achievement, however, is central to instructional leadership. Dinham's (2005) article emphasised the effective principal's role in retaining an emphasis on either solving the achievement problem or continuing on "a quest for enhanced student achievement.....They constantly remind students, staff and the community that the core purpose of the school is teaching and learning" (p. 354). This theme is consistent throughout Chenoweth's (2007) case studies also, and is considered further in the next section of this review. For now, it is important to note that three elements of problem solving emerged from these case studies. The first indicated that principals need to view achievement as a problem, something that can be addressed. The second suggests that principals need to give serious consideration to resolving matters that teachers consider to be problems, and thirdly, principals need to attempt to gain consensus on how to resolve problems. If teachers feel supported, they are likely to be more receptive to requests and apparent constraints to their freedom by the principal. The research summarised here indicates that principals who tackle problems face-on rather than avoiding or ignoring them, are likely to enhance their relationships with teachers and increase the level of cohesion within a school. In time these actions impact positively on student achievement.

In summary, managing a learning environment for what are usually more than 1,000 adolescents in a typical New Zealand secondary school requires good processes. While an orderly environment may not be an adequate predictor of high performance it is likely to be a prerequisite before high performance can be obtained (Louis & Miles, 1990). Secondary school principals are probably more likely to delegate responsibility for student discipline to a deputy rather than assume it themselves, but principals are still ultimately responsible for the tone of the school. The consistent message is that schools that beat the odds to gain better outcomes are free from chaos, the organisational basics are done well, and the principal is an effective problem solver.

Thus far I have referred to evidence of the principal's indirect instructional leadership role. I now turn to evidence of their more direct instructional leadership in the area of goal setting, professional learning, and curriculum delivery. Certainly, it is the focus on addressing the achievement problem that is at the very heart of instructional leadership. Management of the environment is important, but as stated earlier, management has to be focused either on improving outcomes or maintaining high academic standards to be instructional leadership.

Establishing Academic Goals and Expectations

The behaviour of the principal that is cited most frequently as being critical to student achievement is academic goal setting (Hallinger & Heck, 1998) or academic press. The principal can usually be expected to have the most influence over the type and nature of goals set for the school, and these are frequently considered to be of most importance in creating the academic climate required for a school to improve or to sustain performance at high levels (e.g., Bamberg & Andrews, 1991; Bossert, et al., 1982; Dwyer, 1986; Goldring & Pasternak, 1994; Hallinger, 2005; Hallinger & Murphy, 1985; Heck, 2000; Heck & Marcoulides, 1996; Leitner, 1994; Weber, 1989). These findings were supported by several of the eight quantitative studies in secondary schools that were cited in the second section of this review. Heck (1992) found that an emphasis on test results was one of three major predictors of effective schools. Brewer (1993) also found that principal goal setting was related to high performance, as did Gaziel (2007). Recent meta-analyses by Robinson and colleagues (2008), and Marzano, Walters, and McNulty (2005) also supported the importance of goal focus and high expectations with effect sizes of 0.35 and 0.24 respectively for this type of leadership behaviour.

Case study evidence also offers strong support for the importance of academic press. For example, Cheng (1991) carried out case study research in two Hong Kong secondary schools. One was identified as very positive on ratings of relationships and initiating behaviour on the part of the principal and the other was very negative on the same dimensions. Cheng found that the successful principal's keys to success were goal orientation, along with management of the school's professional development programme, and successful recruitment of teachers. The resulting school culture was positive though staff felt they had heavy workloads.

Chenoweth's (2007) case studies also graphically depicted the goal-oriented behaviour of principals required to turn around schools. Time and again the studies recounted principals who would not accept excuses for poor outcomes, had high academic standards, and clearly expressed their vision and expectations in order to create a culture that was conducive to improving outcomes. In one secondary school case study, the author stated that the principal "expects all students to succeed and believes they can, and he expects his faculty to believe the same thing. Many didn't when he first arrived" (p. 117), and the other secondary school case study cited the principal as setting "the bar very high" (p. 51) for the senior management team, the teachers, and the students.

Muijs, Harris, Chapman, Stoll, and Russ (2004), in their literature review of what is required for schools in challenging circumstances, also cited the use of high expectations as a key ingredient in creating a positive climate for student learning. Goal directedness is core to the concept of instructional leadership—in effective schools it drives all other behaviours (Bossert, et al., 1982; Hallinger & Heck, 1998).

Promoting and Participating in Professional Development

Leading and managing the professional development and learning of staff is the second area of direct instructional leadership considered here. Evidence about the effect of professional development or the effective principal's role in it, was lacking from the eight quantitative studies cited earlier, but a recent synthesis of evidence on professional learning and development (Timperley, et al., 2007) suggested that leaders should promote, organise, and participate in professional learning. A principal who participates

in professional development with staff not only demonstrates the importance of the activity, but also learns about what is needed to support the implementation of a proposed course of action (Robinson, et al., 2008). For example, an effective principal could be expected to support professional learning with decisions about financial resources, school timetabling, and the provision of time for teachers to meet. Principals need to reinforce the changes and embed them into the day-to-day practice of a staff that is forever evolving with some members leaving and others starting. But the question arises, “Do principals need to lead the professional learning themselves?” The answer appears to be “No, but they do need to participate in it.” Principal leadership is more likely to be symbolic (e.g., introducing the professional development or participating in it) and organisational (e.g., timetabling it effectively), rather than directly instructional on the part of the secondary school principal.

In secondary schools, professional learning is frequently undertaken at the departmental level, and usually concerns the content and pedagogy of the specific subject area (Timperley, et al., 2007). Teachers do have pedagogical discussions, but not necessarily with the principal (Firestone & Herriott, 1982; Little, 2002; Siskin, 1991). Secondary school principals’ involvement in professional development appears from case study research to vary greatly, often because of the role of heads of departments and the variability of leadership at that level (Rossmiller, 1992). The principal’s role appears to at least require the setting of the professional development agenda and establishing ways to keep the departments’ processes (monitoring student achievement, managing behaviour) consistent, effective, and efficient.

Timperley and colleagues (2007) identified 11 studies in a secondary school context, most of which were in specific subject areas, but three involved whole school participation in learning about cross-curricula strategies (studies related to co-operative learning, restorative justice, and pedagogical relationships between teachers and Māori students). These were successful across departments for a number of reasons. First, they attended to cross-curricula concerns. Second, the senior management team committed time, resources, and their support to the projects. Third, a variety of groupings was used to carry out the professional development (e.g., whole school, groups that cut across departmental lines, departments) and critically, teachers were helped to translate what they had learned into their classroom practices with some form of support (e.g., planning, observations, and feedback).

It is whole-school professional learning that appears to be most helpful in developing a professional community within a secondary school setting, but recent New Zealand evidence indicated that many secondary schools were not strong in this type of approach (Education Review Office, 2009). Of 44 secondary schools, the Education Review Office categorised 27% as having effective school-wide professional learning and development programmes. A second group comprising 30% of the schools had aspects of their programmes that were effective, and the remaining schools that were deemed less effective emphasised individual level professional learning (e.g., courses) and spent more money per teacher on professional development. While less effective schools tended to view teacher professional development as something to be achieved through courses for individuals rather than by whole school development opportunities, most of the effective schools used whole school development practices to focus strongly on student achievement. The whole-school experience brings teachers together across departmental lines and can be useful in examining different teachers' attitudes to the same students and their learning, but teachers still need to develop expertise in their own fields to cater for the higher learning levels of secondary school students (Little, 2002; Timperley, et al., 2007).

Regardless of the nature of the professional learning (departmental or whole school), the research of Timperley and colleagues (2007) suggested that it was critical that teachers' prevailing beliefs and attitudes were challenged. When professional development did not result in improved outcomes, there appeared to be little evidence of this challenge to teachers' current beliefs and values.

Monitoring and Coordinating Teaching and the Curriculum

In secondary schools, many of the tasks related to teaching and learning are likely to be carried out by staff other than the principal, but the principal is still responsible for seeing that the processes are effective. How effectively these essential management practices are monitored and, if necessary, altered, impacts on teachers and their motivation. Analysis of data is central to this—only through data can effectiveness of programmes be assessed.

Principals need to be 'data-literate' (Earl & Katz, 2006; Organisation for Economic Co-operation and Development, 2008). They need to know enough to ask the right questions of data. So while they don't necessarily have to have the wherewithal to do the analysis themselves, they need enough knowledge

to be assured that they are not only asking the right questions, but interpreting the data they have in a defensible way. Only then can they use those data along with staff to inquire into the effectiveness of their practice.

In Timperley and colleague's (2007) study, data were frequently cited as the source of challenge to teachers. For example, evidence that some students could learn more rapidly than teachers thought possible if certain methods were applied, were shown to shift teacher beliefs and practices. Teachers' theories regarding how learning occurs had to be actively engaged if new learning was to impact on practice. This discomfort that challenged teachers' thinking left them open to understanding and using new practices. The challenge for principals is to develop a team of teachers that is open to such data-based learning. Most of the less effective schools in the aforementioned ERO study "made only limited use of student achievement data and were unable to accurately identify students' learning needs, set appropriate targets and then plan to meet these targets" (Education Review Office, 2009). And an earlier review of the collection and use of assessment information in secondary schools also indicated much room for improvement (Education Review Office, 2007).

Use of data to inquire into effectiveness of practice is imperative to school evaluation and improvement. Fullan (2008) argued that data needs to be used in three ways: to compare progress over time within a school, to compare performance to similar schools, and to compare to a standard the school is trying to achieve. "This means that learning to improve things must be built into the day-to-day culture of the work" (Fullan, 2008, pp. 27-28). This doesn't necessarily mean that a principal has to lead this inquiry into data, but they must value it and support it if it is to take root with teachers. It is knowledge of what is required that is important, or, as Fullan (2008) said: "In short, leading knowledgeably is at the core of all highly effective organizations...Knowledge is literally the substance of change" (p. 31).

One successful strategy for improving outcomes and achieving consistent inter-departmental practices and outcomes can be to have teachers from differing departments that teach the same students, compare and discuss results (National College for School Leadership, n.d.). If one teacher has most students passing their subject when another teacher of the same students has not, the difference needs to be inquired into. The series of case studies from the National College for School Leadership in the

United Kingdom showed how such strategies can be used by schools to gain improvement. Recent New Zealand evidence (Highfield, 2010) has also indicated that within-school variation between departments with the same students may be a good starting place for examining school effectiveness. In effective schools, a culture has to develop that replaces the norms of teacher privacy and autonomy with one of collective responsibility and inquiry (Bryk & Schneider, 2002; Elmore, 2004; Lee & Smith, 1996; Timperley et al., 2007).

Developing a Sense of Collective Responsibility

Earlier, I referred to a study by Lee and Smith (1996) that showed that teachers in low SES areas were likely to attribute student learning levels to factors other than their own teaching. These researchers measured what they termed the collective responsibility of teachers. Items that were highly indicative of teacher attitudes included “Little I can do to insure high achievement (reversed); I can get through to the most difficult student” (Lee & Smith, 1996, p. 134). They found that the link between collective responsibility and academic outcomes was very strong. The mean achievement gains of students in schools with high collective responsibility were significantly higher than those with medium responsibility, as well as those with low levels of responsibility. Obviously, SES, and teacher and student effects are difficult to untangle, but it appears that a school is unlikely to improve if the teachers take sanctuary from responsibility by blaming external factors for lack of success.

So how can a principal influence the collective responsibility of teachers, and how much influence can the principal have on so many individuals’ attitudes and work habits? There is some distance between the secondary school principal and the individual teacher. The trend of evidence in this review suggests that both indirect and direct instructional leadership by the principal can be effective in impacting on teachers’ attitudes and effectiveness.

Conclusion

It has been suggested that conceptualising the principal as having three sources of power (positional, expert, and interpersonal) and thinking about the decisions made by a principal as the enactment of their instructional leadership, may support secondary school principals to manage their instructional leadership role regardless of their context. They may not always, or even, often, have a direct impact on

the classroom. But if their focus is on improving outcomes, their decision making across a range of problems is likely to impact positively on outcomes. Principals need to bring both pedagogical and management expertise to bear on their decision-making if they are to improve outcomes.

Much of the aforementioned research indicated that it is not one or two individual behaviours by a principal that result in a more conducive school culture that in turn impacts on school performance, but rather the cumulative effects of many principal decisions and behaviours. In secondary schools that are usually large and departmentalised in nature, the principal is reliant on the staff to carry out goal oriented behaviour. The closer the trust and cohesion between the principal, senior management team, and department heads, and the better the task management in the school, the more effective the school is likely to be (Hofman et al., 2001; Marcoulides & Heck, 1993; Robinson, 2008; Rutter et al., 1979; Siskin, 1991).

The way secondary school principals carry out their instructional leadership reflects the reality of the principal's role. Certainly, Robinson and colleagues (2008) noted that the instructional leadership dimension that they identified as *Planning, coordinating, and evaluating teaching and the curriculum* may not apply equally to secondary school leadership. The emphasis on these types of direct behaviours may be putting unnecessary and unhelpful pressure on principals who are focused on student outcomes, but mainly achieve their desired outcomes by managing a myriad of responsibilities and people. The secondary school principal's role, by necessity, is more one of vision and facilitation rather than direct instructional leadership of teachers (Bolam & Turner, 2003; Firestone & Herriott, 1982; Keese, 2005; Kerry, 2005; Siskin, 1991). The model of instructional leadership for secondary school principals, and indeed all principals, needs to be re-thought and take into account their individual contexts and the reality of the tasks they face daily.

The secondary setting makes the challenge of the principal's instructional leadership one of developing agreement around core goals, institutionalising ways of working (e.g., decision making) that improve cohesion, coordinating across departments, and influencing others in a goal-oriented direction. Principals in these settings need to work on the development of a school-wide culture that is focused on data-based inquiry and improvement and is embedded by the leadership of teachers and middle

management (Foster, 2004; Fullan & Newton, 1988). How they can build such a culture is the focus of this research.

A major question is left unanswered by this review. While I have argued that principals usually utilise indirect instructional leadership and that this is effective, it is not clear if principals in the most effective schools (i.e., those in higher-performing or improving schools) utilise direct instructional leadership to a greater extent than other principals. Some evidence points to this but it is not so evident in quantitative studies in secondary school settings. This is a key area for investigation in Study 2: What instructional leadership behaviours do secondary school principals use and how effective are they? I also investigate the effects of contextual factors and try to assess whether it is a reasonable assumption that principals impact on outcomes through their influence on school culture.

Chapter 4: Developing a Measurement Tool for Instructional Leadership in Secondary Schools

This chapter describes the development of a questionnaire that was designed to measure principals' instructional leadership in secondary schools and the culture of the schools. The design and components of the questionnaire were heavily influenced by numerous researchers (Alig-Mielcarek & Hoy, 2005; Hallinger & Heck, 1996, 1998; Hallinger & Murphy, 1985; Heck, 2000; Heck, et al., 1991; Robinson, et al., 2008). While there is some agreement on the key instructional leadership behaviours associated with improvements in student outcomes (e.g., setting and communicating goals), the dimensions themselves and the indicators (survey items) of each dimension differ from researcher to researcher. The grouping of items into dimensions of instructional leadership reflects the researcher's theory of instructional leadership. In this case, the work of Robinson and colleagues (2008) who identified five instructional leadership dimensions was the starting point for the theoretical model for a questionnaire.

Robinson and colleague's dimensions are as follows:

- 1 Establishing goals and expectations
- 2 Strategic resourcing
- 3 Planning, coordinating, and evaluating teaching and the curriculum
- 4 Promoting and participating in teacher learning and development
- 5 Ensuring an orderly environment

These dimensions will henceforth be referred to in their shortened form, as *Goals*, *Strategic Resourcing*, *Teaching and Curriculum*, *Professional Development*, and *Orderly Environment*. As the development of the questionnaire proceeded, two further dimensions were added: *Resolving the issues of staff and students* (referred to as *Problem Solving*, for brevity) and *Establishing a sense of collective responsibility* (*Collective Responsibility*). Robinson and colleagues (2008) included *Collective Responsibility* items in the *Professional Development* dimension and *Problem Solving* items in the *Orderly Environment* dimension, but as there was evidence of these behaviours being effective in secondary schools (Heck, 1993; Lee & Smith, 1996), I sought to investigate these specific behaviours by separating them out into two additional dimensions.

In the literature review (Chapter 3), I proposed that principal instructional leadership needed to be investigated in terms of direct and indirect instructional leadership, and that the culture of the school may be a moderator for instructional leadership. In order to test these hypotheses, a measure was needed of both the direct and indirect instructional leadership of principals as well as a measure of school culture.

Measuring Instructional Leadership

The task of developing or selecting items for the questionnaire’s dimensions began with a review of items that had been used previously in this type of research. Hallinger and Murphy (1985) are credited with creating the tool used most often in instructional leadership studies (Hallinger, 2005). Their instrument, the Principal Instructional Management Rating Scale (PIMRS), was based on a review of educational leadership and effective schooling literature. The PIMRS framework comprises three major dimensions and 11 *job descriptors* or sub-dimensions that more specifically defined the dimensions. The 11 job descriptors were represented by a total of 71 one-sentence items describing principals’ instructional leadership. Between 4 and 11 items were used for each job descriptor. The respondents (teachers) had to assess how frequently the principal carried out the behaviour on a Likert-type scale that rated behaviours from *almost never* to *almost always*.

Table 11 Summary of Instructional Leadership Dimensions of Hallinger and Murphy (1985) and Murphy (1990)

Hallinger and Murphy (1985)			
Defines the mission	Manages instructional program	Promotes school climate	
Framing and communicating school goals.	Supervising and evaluating instruction, coordinating curriculum and monitoring student progress.	Protecting instructional time and enforcing standards, promoting professional development, maintaining high visibility, and providing incentives for teachers and students.	
Murphy (1990)			
Developing missions and goals.	Managing the educational production.	Promoting an academic learning climate.	Developing a supportive work environment.

Table 11 illustrates how the three core dimensions as identified by Hallinger and Murphy (1985) were further developed by Murphy (1990) into four dimensions. Both models include reference to dimensions that are similar to Robinson and colleagues' *Goals* and *Teaching and Curriculum* dimensions. Hallinger and Murphy's third dimension included *Orderly Environment* and *Professional Development* items, but Murphy (1990) divided out *Orderly Environment* items (*Developing a supportive work environment*) from other indicators promoting an academic climate (*Promoting an academic learning climate*).

Around the same time, Heck, Marcoulides, and Lang (1991) developed another model based on three dimensions. The questionnaire comprised of only 22 items and the dimensions appeared to have quite a lot of overlap in the type of items. For instance, items referring to *Goals* and *Teaching and Curriculum* are both found in two of the three dimensions (i.e., *School Climate* and *Instructional Organisation*). The *School Climate* dimension was similar to Murphy's *Goals* and *Supportive Environment* dimensions. The dimensions of Heck and colleagues are summarised in Table 12 below.

Table 12 Summary of Heck, Marcoulides, and Lang's (1991) Instructional Leadership Dimensions

Governance	School Climate	Instructional Organisation
Leadership that involves staff and parents and protects teachers from undue pressure.	Leadership that communicates high goals and expectations keeps the community informed and the environment disciplined and orderly.	Leadership that develops goals, coordinates the programmes, observes teachers, secures resources, and provides in-service training.

Heck (2000), on the other hand, used a longer survey developed in Hawaii which explicitly examined principal instructional leadership as well as five dimensions of school culture with 60 items in all. This questionnaire separated the principal instructional leadership behaviours from indicators of culture. The principal instructional leadership dimension included items that could be classified as relating to *Goals*, *Teaching and Curriculum*, *Strategic Resourcing*, and *Orderly Environment* items under the model of Robinson and colleagues (2008). The five cultural dimensions Heck's survey measured are outlined in Table 13.

Table 13 Summary of Heck’s (2000) Cultural Dimensions

High expectations for student achievement.	An emphasis on academics.	Frequent monitoring of student progress.	Positive school climate.	Positive relationships between the school and community.
--	---------------------------	--	--------------------------	--

Heck’s (2000) model was favoured as an example of how to structure a new survey because it was explicit about investigating the principal’s role as well as the culture of the school. This was also preferred as an example of a mediated effects model as opposed to other models that measured principal behaviour and school performance outcomes only (i.e., a direct effects model).

A shortcoming of Heck’s questionnaire for the desired purposes of this study, was that just one of the 60 items focused on *Professional Development* (“Teachers participate in professional development activities to keep up-to-date on instructional practices”), and just one item focused on *Strategic Resourcing* (“The principal makes sure there are sufficient resources for effective instruction”). That aside, the items in the questionnaire were comprehensive.

A more recent survey of instructional leadership behaviours is that of Alig-Mielcarek and Hoy (2005). These researchers reviewed three previous models of instructional leadership (Hallinger & Murphy, 1985; Murphy, 1990; Weber, 1989) but did not include Heck’s (2000) model. Alig-Mielcarek and Hoy used 27 items, with nine items representing each of three dimensions. The instrument was ultimately refined to 23 items as “exploratory factor analyses demonstrated that 23 of the items loaded on three hypothesized dimensions” (Alig-Mielcarek & Hoy, 2005, p. 35). These items are summarised in Table 14 and were used with over 4000 teachers in 146 Ohio elementary schools.

Table 14 Summary of Alig-Mielcarek and Hoy’s (2005) Instructional Leadership Dimensions

Promotes school wide professional development.	Defines and communicates shared goals.	Monitors and provides feedback on the teaching and learning process.
--	--	--

The tool used by Alig-Mielcarek and Hoy (2005) had the strongest *Professional Development* dimension, an important consideration given Robinson and colleague's (2008) finding of a strong effect size ($d = 0.84$) for this dimension. This model also preserved the centrality of the dimensions of *Teaching and Curriculum* (*Monitors and provides feedback on the teaching and learning process*) and *Goals* (*Defines and communicates shared goals*). On the other hand, Alig-Mielcarek and Hoy's questionnaire made no mention of ensuring an orderly and supportive environment. It did not include, for example, items pertaining to the maintenance of high standards of student discipline or the protection of staff from undue pressure. Further, there was no assessment of strategic resourcing or principal decision making and problem solving. Nevertheless, it was decided to use some items from this questionnaire for a new tool and use a model, similar to that of Heck (2000), that separated the principal's role from the measurement of the school culture.

Other items were originally largely sourced from Heck (2000), Hallinger and Murphy (1985), and Heck, Marcoulides, and Lang (1991). Eleven items from Alig-Mielcarek and Hoy's (2005) questionnaire, (some with minor wording alterations such as removing the word "in-service" from the phrase "professional development in-service"), provided the majority of items for my *Goals*, *Teaching and Curriculum*, and *Professional Development* dimensions. Several items that were more appropriate for New Zealand's self-managing environment were later sourced from various other researchers' tools e.g., two from Smith and Andrews (1989). One or two were composite items using much of another researcher's words and at least one ("the principal takes care to recruit high quality staff") was my own as the importance of quality teacher selection, as suggested by Brewer (1993), was a significant gap in previously published tools when the devolved nature of New Zealand's self-managing environment was considered.

Creating a Teacher Survey of Instructional Leadership and Culture

In order to develop a new survey that would fit my theoretical model, all the items from the questionnaires described in this chapter were initially mapped against Robinson and colleague's (2008) five dimensions. A review of all indicators was taken, eliminating items that did not appear to be strong enough as statements or that did not have very strong effect sizes as indicators of instructional leadership behaviours. At this stage, items suggested by Lee and Smith's (1996) findings on teachers' collective responsibility for learning were added, and it was decided to assess collective responsibility as

a separate dimension, rather than including such items in the *Professional Development* dimension as Robinson and colleagues had done, due to the evidence of its strong effect. Items pertaining to problem solving were also separated out so that they could be investigated separately. In the case of Heck (1993), problem solving items were evident in all of his three dimensions, and Robinson and colleagues (2008) had included these items under *Orderly Environment*.

Table 15 Dimensions for the Principal Instructional Leadership and Culture Questionnaire

Dimension	Description
Ensuring an orderly environment (<i>Orderly Environment</i>)	Protecting staff from undue pressure; sharing leadership roles; providing a safe, supportive, and orderly environment; protecting instructional time from interruptions; handling discipline fairly.
Establishing goals and expectations (<i>Goals</i>)	Setting and communicating high but achievable expectations; setting data-driven, academic goals collaboratively with teachers; having a shared commitment to goals; believing standards are challenging but attainable; using data driven academic goal setting to improve student learning.
Planning, coordinating and evaluating teaching and curriculum (<i>Teaching and Curriculum</i>)	Using data to improve teaching; helping teachers interpret data and discuss results and improvement strategies; carrying out classroom observations and providing useful feedback; being the person that teachers can turn to with instructional problems; ensuring systematic monitoring.
Promoting and participating in professional development (<i>Professional Development</i>)	Actively participating in professional development activities; providing professional development that is linked to needs of students and school goals; encouraging teachers to attend professional development on instructional best practices; encouraging teachers to attend professional development aligned to school goals.
Strategically resourcing the school (<i>Strategic Resourcing</i>)	Recruiting high quality staff; aligning resources to needs of students and to school goals; aligning budgets to goals; providing useful resources and allocating them fairly.
Establishing a sense of collective responsibility (<i>Collective Responsibility</i>)	Challenging teachers not serving students well; taking responsibility for the outcomes of all students regardless of home background; building a climate where teachers take responsibility for the outcomes of all students.
Resolving the issues of staff and students (<i>Problem Solving</i>)	Addressing staff and student issues in a timely and effective way; balancing needs of staff with the need to serve students well.

Thus, through an iterative process, seven dimensions and the items they would comprise were decided upon and are summarised in Table 15.

Construction of the Questionnaire

Multiple indicators are required to measure a concept (Bryman, 2004). At least four items per dimension were produced including at least two statements directly related to the principal's role and two items about the attitudes, values, and behaviours of staff (to be used as indicators of culture). For example, to measure *Strategic Resourcing* behaviours, six statements were developed—the first two to measure principal instructional leadership and the last four to measure school culture:

The principal...

- *ensures availability of effective teaching resources that are aligned to school goals*
- *successfully recruits high quality staff*

Staff members in this school...

- *think school budgets are aligned with priority teaching goals*
- *think time on professional development is used productively*

In this school...

- *useful teaching resources are provided for teachers*
- *resources are fairly allocated to support teachers' efforts to improve learning*

The language used in the items that related to the principal's role (See the teacher questionnaire in Appendix B, questions 1–10 and 41–50) used words such as *encourage* and *ensure* at the beginning of many sentences, reflecting findings of the literature review that concluded that secondary school principals were more likely to facilitate the learning environment through deputies and heads of departments rather than have a direct leadership role (Bolam & Turner, 2003; Siskin, 1991). In this way, the questionnaire was designed to test the instructional leadership of principals in the teaching and curriculum areas, whilst acknowledging that much of this was likely to be implemented by others. The attempt, therefore, was to create a fair test of what secondary school principals might be expected to do across the dimensions. So, for example, the questionnaire didn't ask how often the principal carried

out classroom observations, but it did ask (as a cultural item) whether staff members were provided with useful feedback after classroom observations were carried out, the implication being that the principal has to establish the conditions for this to occur.

In finalising the questionnaire, one further decision that had to be made related to the type of scale to be used. This process was required given that the models that the items had largely been derived from (Alig-Mielcarek & Hoy, 2005; Heck, 2000) used differing response scales. Alig-Mielcarek and Hoy used a four point Likert-type scale from *almost never* to *almost always* thereby seeking frequency of behaviour while Heck's survey used a five point scale and asked for agreement with statements describing particular leadership behaviours (i.e., *strongly agree* to *strongly disagree*). The decision was taken to assess the frequency of behaviours as this was the dominant practice in similar research (Gaziel, 2007; Heck, 1992), and therefore made results more comparable. In essence, it is proposed that it is the frequency and effects of behaviour that principals are concerned with. For example, when Krajewski (1978) interviewed principals they cited the behaviours they carried out most (i.e., indirect instructional leadership behaviours) and compared it to those they thought they should mostly carry out (i.e., direct instructional leadership behaviours). In addition, a piloting of two different versions of the questionnaire with the staff of one school showed that the frequency of the principal's behaviour (*almost never* to *almost always*) was reported more consistently (less variance in responses) than the strength (*strongly agree* to *strongly disagree*). It is proposed for this research, that it is important to provide principals with some evidence of the effects of frequency of behaviour as these can be more readily assessed than relative strength.

Dimensions: Direct and Indirect

As a consequence of the findings of the literature review (Chapter 3), the dimensions were divided into direct and indirect dimensions (Hallinger & Murphy, 1987; Kleine-Kracht, 1993) so that the relative frequency and effects of these behaviours could be compared. The direct dimensions are those that involve the principal in ensuring the quality of teaching and learning activities, promoting and participating in professional development activities, and ensuring that teachers serve all students well (*Collective Responsibility*). The indirect dimensions are those that involve the principal in managing an orderly environment, resourcing strategically, and problem solving matters that affect teachers and

students. Table 16 categorises the seven dimensions as direct and indirect instructional leadership for reader clarity.

Table 16 Direct and Indirect Dimensions

Direct Instructional Leadership	Indirect Instructional Leadership
Goals	Orderly Environment
Teaching and Curriculum	Strategic Resourcing
Professional Development	Problem Solving
Collective Responsibility	

It could be argued that problem solving is a direct instructional leadership activity, particularly if the problem to be solved relates to student achievement levels. But the literature review pointed out that problem solving of another nature is also important to teachers—problems that relate to adequacy of resources, and the back up and protection of teachers from external pressures. The problem solving items in this questionnaire (See Appendix B for items 39, 40, 49, 50) are therefore related to the latter type of problem only, while the former type is covered in the *Teaching and Curriculum* dimension by asking if the principal is the person teachers in the school turn to with instructional concerns or problems (Item 5) and if the principal ensured systematic monitoring of all students’ progress (Item 6). In this way, a distinction is made between the involvement of the principal in problem solving about the quality of teaching and learning, and the involvement of the principal in problem solving about the conditions for teaching and learning (e.g., resourcing, school discipline, staffing).

Similarly, it could be argued that behaviours categorised as *Goals* could be considered indirect instructional leadership. Goal setting could refer to social, sporting, and cultural outcomes as well as academic outcomes. While the former types of goals may be worthy, as argued in Chapter 1, it is the academic focus that defines instructional leadership. Alig-Mielcarek and Hoy (2005) considered *Goals* to be a direct form of instructional leadership and this dimension along with a focus on the quality of *Professional Development* and *Teaching and Curriculum* appear to be those most consistently described as the core instructional leadership behaviours in historical models. Thus, the view taken here was, just as Kleine-Kracht (1993) concluded, that these three behaviours are most closely related to teaching and as such are defined as direct instructional leadership along with establishing a sense of collective

responsibility (*Collective Responsibility*); an important feature of effective schools (Elmore, 2004; Lee & Smith, 1996; Marks & Louis, 1999; Newmann & Wehlage, 1995).

A final 10 items (See Appendix B, Items 51–60) in the questionnaire investigated “Who mainly carries out this role in your school?” and provided options as follows: “Principal, DP/AP, HOD/HOF, No one, Name another role”. The purpose of these items was to clarify who carried out some key roles aligned to the five dimensions of Robinson and colleagues (Robinson, et al., 2008)—principals, deputy principals or assistant principals, heads of departments or faculties, or others. For example, for the *Strategic Resourcing* dimension, teachers were asked:

Who mainly carries out this role in your school?

- *Setting departmental budgets?*

- *Recruiting and appointing teachers?*

As this example of items for one dimension shows, the questionnaire was designed to measure not only the degree of principal instructional leadership and the culture of the school, but also who carried out some core instructional roles within a secondary school.

Examples of two *direct* instructional roles were:

Who mainly carries out this role in your school?

-*helping teachers to interpret assessment data for instructional implications.*

-*carrying out classroom observations of teaching practice.*

Dimensions: Principal and Cultural

Thus, the questionnaire (Appendix B) was made up of 60 items measuring seven dimensions of instructional leadership. Table 17 shows how the questionnaire was divided into further dimensions that separated the principals’ behaviours (Items 1–10, and 41–50) from items that tested the culture within schools, essentially the instructional leadership depth and breadth within the school (Items 11–40). This allowed the relationship between the principal and cultural items to be investigated. These items are

also summarised by dimension in Appendix C. In addition, as noted above, a further 10 items investigated the specific role of the principal compared to other leaders in the school (Items 51–60).

Table 17 Items by Dimensions

	Orderly Environment	Goals	Teaching and Curriculum	Professional Development	Strategic Resourcing	Problem Solving	Collective Responsibility
Principal Dimensions	1, 2	3, 4, 44	5, 6, 45, 46	7, 8, 47, 48	9, 10	49, 50	41, 42, 43
Cultural Dimensions	11, 12, 21, 22	13, 14, 23, 24, 34	15, 16, 25, 26, 35, 36	17, 18, 27, 28, 37, 38	19, 20, 29, 30	39, 40,	31, 32, 33

The principal items tested teachers’ perceptions of some specific instructional behaviours that might be expected of a principal whilst the cultural items asked teachers to make judgements about the overall leadership of the school and school culture (i.e., the attitudes, beliefs, and instructional behaviours of staff). Many of the latter items began with the predicate, “Staff members in this school...” (Items 11–20), or “In this school...” (Items 21–30), with a further ten having the predicate, “Our leadership ensures that ...” (Items 31–40). These items gauged some aspects of professional community such as the focus on use of assessment data, the sense of collective responsibility of staff, and the willingness to help each other by discussing results and strategies. Overall the expectation was that there would be some alignment between results from the principal and cultural dimensions.

Instrument Reliability

Estimates of reliability (Cronbach’s alpha) were calculated for all dimensions. As shown in Table 18, they all showed an adequate level of reliability. Scores ranged from .65 to .89. An alpha coefficient of > 0.80 is considered highly reliable, the two coefficients of .71 are considered ‘reliable’ but the .65 for *Principal Strategic Resourcing* can only be considered marginally reliable (Cohen, et al., 2007).

Table 18 Cronbach Alpha Scores for Dimensions

	Principal Dimensions	Cultural Dimensions
Orderly Environment	.72	.73
Goals	.71	.82
Teaching and Curriculum	.84	.86
Professional Development	.83	.85
Strategic Resourcing	.65	.84
Collective Responsibility	.84	.71
Problem Solving	.89	.85

Construct Validity

Confirmatory factor analysis allows a theory about principal instructional leadership and school culture to be built and tested. Heck (1993) stated that “The logic of confirmatory factor analysis forces one to clarify the conceptual reasons for allowing the observed variables to be grouped with the particular latent leadership domains they are hypothesized to measure before the model is actually tested with the data” (p. 156). Exploratory factor analysis, on the other hand, is unrestricted and would have allowed all items to relate to each other, and, in all likelihood, two or three dimensions may have been revealed. Heck and Moriyama (2010) have criticised this tendency of researchers to test relationships between factors rather than “building and testing a theory” (2010, p. 378).

Given the hypothesis that secondary school principals exert much of their influence via indirect instructional leadership, and that school culture is a moderating variable, structural equation modelling (SEM) was used to test the proposed theory of direct and indirect leadership and the impact of school cultural dimensions. A series of covariance structure analyses of the data was conducted using AMOS (Arbuckle, 2003). This type of analysis improves on the traditional techniques to establish confirmatory factor analysis, whilst including path and regression analysis. As such, testing this proposed measurement model was a two-step process. First, confirmatory factor analysis was used to test the hypothesised model with the assumptions that each item only loaded on its expected latent variable, and that the strength of the relationship between the latent variables (i.e., dimensions) would be strong. Specifically, this aspect of model testing uses CFA to construct the latent variables from their representative items to assess the validity and reliability of the measure. Secondly, the included path and regression analysis enables the hypothesised relationships among the latent variables to be tested.

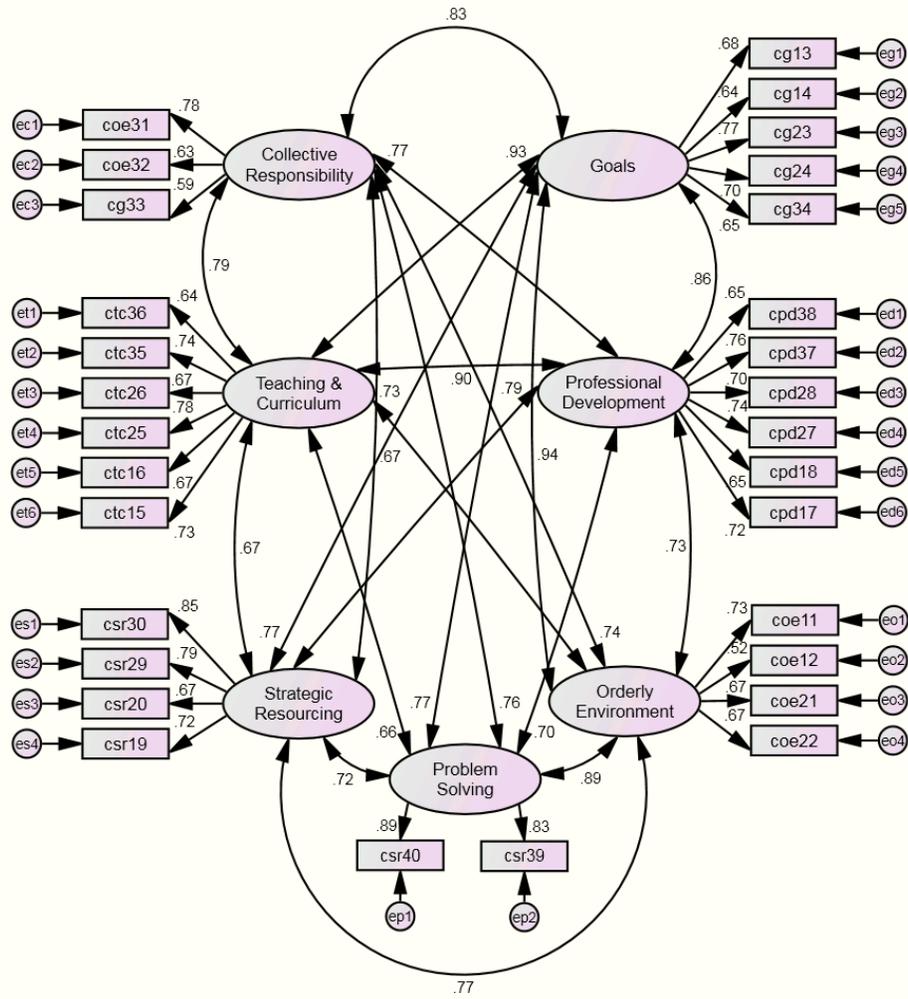
Here, the model is tested to assess whether the hypothesised relationships between latent variables show consistency with the empirical relationship patterns found in the data.

Further, SEM allows for the reality that there is never a perfect fit between a scale's theoretical construct and its subsequent measured value. Given this, an error variance (not depicted in the figures presented) for each item is set by constraining the values associated with each item which is equal to the variance of the measure multiplied by one minus the reliability (Jöreskog & Sörbom, 1992).

A measurement model was constructed that could investigate the relationship between the principal and cultural dimensions and establish the quality of fit of the model, to these data. A structural model of the items in each construct was built and all constructs were allowed to relate to each other in order to answer the question: "Given these constraints, does the model fit the data?".

The cultural dimensions, as depicted in Figure 4 showed very high correlations between both *Goals* and *Teaching and Curriculum* (.93), and between *Goals* and *Orderly Environment* (.94). As I had theorised in Chapters 1 and 3, academic press underpins all dimensions, so high correlations between dimensions were expected. Thus, while items relate to distinctly different behaviours, they all collectively contribute to a press for academic achievement. The overall levels of correlation were satisfactory and there was sufficient discrimination to proceed (while recognising this higher degree of overlap in some of the scales). Further, this model's goodness-of-fit statistics were satisfactory, thus permitting meaningful interpretations to be made from this model (see Model 1 in Table 19).

Figure 4 First-Order CFA Model of Scores from the Cultural Dimensions

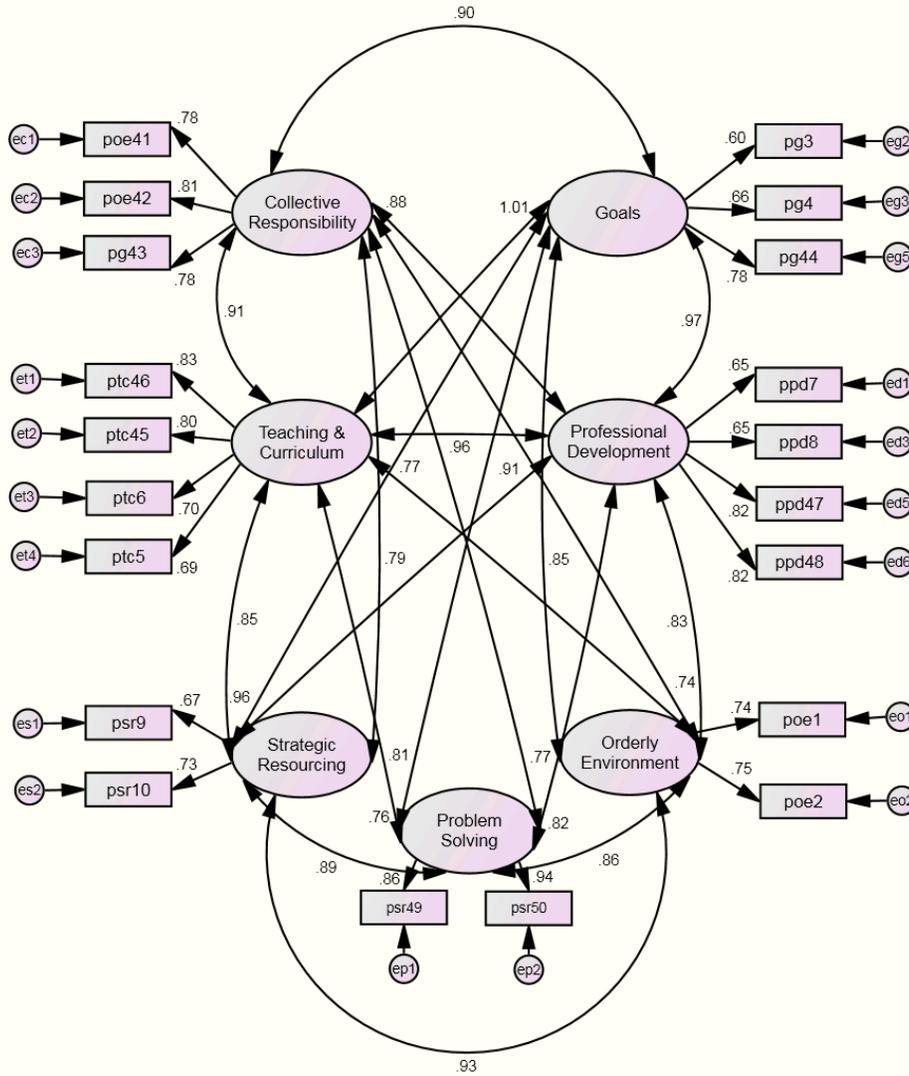


Construct Validity: Principal Dimensions

Even more than the Cultural Dimensions, the Principal Dimensions showed a high level of redundancy (see Figure 5). While the scales are used in subsequent analyses, this high degree of relationship makes it more difficult to ascertain specific influences from the principal perspective. An examination of the individual items for each dimension reveals, nonetheless, that they are testing different behaviours. Again, I concluded that there is a strong higher-order factor related to all these dimensions as indicated by high correlations. All of these behaviours combined are exerting an influence that is difficult to untangle because the focus on improving academic achievement is inherent in them all (i.e., academic press).

As with the cultural dimensions, the goodness-of-fit statistics employed to evaluate the principal dimensions indicated that a satisfactory fit was achieved for this model (see Model 1 in Table 19). Thus, the hypothesised relationship between the latent variables assessed by the questionnaire, appeared to reliably model the relationships found occurring empirically in the data. As will be shown in the next chapter, whilst there was a lot of overlap of dimensions, there was sufficient discrimination to associate different behaviours with different outcomes for the various groups of schools.

Figure 5 First-Order CFA Model of Scores from the Principal Dimensions



Evaluation of Model Fit

Next, four competing Confirmatory Factor Analysis (CFA) models (Models 1– 4) were examined, with each relating to previous hypotheses regarding the structure of principal instructional leadership and the culture of the school. As mentioned earlier, while there is reasonable agreement regarding the factors or behaviours that reflect instructional leadership, there remains much conjecture as to the factorial structure of these dimensions.

Given this, three models structured under a second-order approach were compared to the first model—the first-order seven-factor model proposed in this thesis. Thus, Model 1, consisting of a multi-dimensional structure, was examined where the factors of *Collective Responsibility*, *Teaching and Curriculum*, *Strategic Resourcing*, *Problem Solving*, *Orderly Environment*, *Professional Development*, and *Goals* were correlated.

Model 2, a second-order factorial structure was fit to the data, where this model was based on the view that instructional leadership can be defined by direct instructional leadership (*Goals*, *Teaching and Curriculum*, *Collective Responsibility*, and *Professional Development*), and indirect instructional leadership. In Model 2, indirect instructional leadership was defined by *Strategic Resourcing*, and one factor consisting of both *Problem Solving* and *Orderly Environment*. This model was a closer approximation of the model used by Robinson and colleagues (2008) in that their model included problem solving items in the *Orderly Environment* dimension.

Model 3 posited a similar structure for instructional leadership and was defined by direct (*Goals*, *Teaching and Curriculum*, *Collective Responsibility*, and *Professional Development*) and indirect (*Strategic Resourcing*, *Problem Solving*, and *Orderly Environment*) instructional leadership. The difference here from Model 2 is that *Problem Solving* and *Orderly Environment* are not combined; rather they are maintained as distinctly separate factors. The structure of these three competing models (Models 1–3) was applied individually to the principal and cultural questionnaire items respectively.

Another approach to validating a factor structure is to combine the measures of the latent constructs (i.e., items) together. In this instance, this would test whether the overall fit of the model is enhanced when the two separate dimensions of principal instructional leadership and culture are combined together under a second-order structure of indirect and direct instructional leadership (Model 4). As such, the cultural items were merged together with the principal items. This model was produced to more closely reflect another theory of instructional leadership that includes school climate or culture such as that of Heck and colleagues (1991) and Heck (2000). The cultural items refer to indicators of school quality as opposed to specifically mentioning the principal; a common approach to establishing levels of instructional leadership in a school.

Evaluation of the Factorial Structure of the Principal Instructional Leadership and Culture Questionnaire

On the basis of the recommendation of Hoyle and Panter (1995), this study included both absolute and incremental goodness-of-fit indexes for comparing models and analysing invariance. The absolute fit index was represented by the popular chi-square statistic, although this statistic is problematic in terms of its power, especially with larger samples (Marsh, Bella, & McDonald, 1988). As Byrne (2001) noted, no matter how well postulated a model is, it will always be falsely rejected given sufficient sample size. Thus, the chi-square statistic (χ^2) is reported but is not overly emphasised in the results. Also, because some of the analyses involved nested models, the model fit for these was assessed using the chi-square difference test as well as other incremental fit indexes. Following the suggestion of Conroy, Metzler, and Hofer (2003), greater emphasis was placed on the incremental fit indexes, as these “are less sensitive to sample size and are more appropriate for evaluating badness of fit in regard to misspecification of factor loadings” (Conroy, et al., 2003, p. 407).

The incremental goodness-of-fit indexes used were the comparative fit index (CFI: Bentler, 1992), the Tucker–Lewis Index (TLI: Tucker & Lewis, 1973), the normed fit index (NFI: Bentler & Bonett, 1980), the incremental index of fit (IFI: Bollen, 1989), and the root-mean-square error of approximation (RMSEA: Steiger & Lind, 1980). The CFI and the TLI have coefficient values ranging from 0–1.00, with values of (or near) .90 and higher traditionally viewed as representing good fit (Bentler, 1992). The NFI also has coefficient values ranging from 0–1.00. A value of greater than .90 has traditionally been used to indicate a good fit, but a .95 cut-off point has been suggested as more appropriate (Hu & Bentler, 1999) or to indicate a “superior fit” (Byrne, 2001, p. 83). It should be noted that NFI tends to underestimate fit (Byrne, 2001). The incremental index of fit (IFI) was also used, however, and this index of fit was “developed by Bollen (1989b) to address the issues of parsimony and sample size which were known to be associated with the NFI” (Byrne, 2001, p. 83). The same values of greater than .90 indicating a good fit apply with this fit index. Although there is conjecture around suggested fit values for the RMSEA, generally there is mediocre to good fit where values fall between .08 and .10 and very good fit where values are below .08 (Browne & Cudeck, 1993; Byrne, 2001; MacCullum, Browne, & Sugawara, 1996).

Results

The goodness-of-fit statistics for the models (see Table 19) showed that the poorest fit was achieved in Model 2 under both principal and cultural versions, and the combined Model 4. The RMSEA values for these models were larger than .10 under both dimensions, indicating that they displayed only mediocre fit to the data. The fit indexes for Model 1, although only moderately better than Model 3, suggested that the first-order seven factor model of instructional leadership was best able to describe the data. The fit of this structure was further reinforced by the narrow ($\pm .01$) confidence intervals (CI) around the RMSEA estimate. Specifically, the RMSEA values (principal dimension = .09; cultural dimension = .07) represent reasonable fit (MacCullum, et al., 1996), and there is a 90% chance that the true RMSEA value falls within each dimension's narrow bounds (Byrne, 2001). These values indicate reasonable errors of approximation to the population (Browne & Cudeck, 1993). The additional four indexes of incremental fit showed the highest fit values for Model 1 across both principal and cultural dimensions. It is worth noting that although the cultural dimensions under Model 1 did not produce indexes as high as those under the principal dimensions, the fit indexes were higher than any of the other factorial structures under the cultural dimensions. In addition, an important finding for this model was the low RMSEA value (.07) produced by the cultural manifest variables (i.e., items), indicating that Model 1's factorial structure reflects a strong level of accuracy under the cultural dimensions.

Table 19 Fit Indices for Structural Models to the Principal and Cultural Dimensions

Dimensions		<i>df</i>	χ^2	<i>p</i>	NFI	TLI	CFI	IFI	RMSEA (90% CI)
Principal	Model 1	149	944	<.001	.89	.87	.91	.91	.09 (.08–.10)
	Model 2	148	929	<.001	.83	.83	.85	.82	.13 (.11–.15)
	Model 3	148	930	<.001	.85	.86	.90	.91	.10 (.09–.11)
Cultural	Model 1	384	1749	<.001	.85	.85	.87	.88	.07 (.06–.08)
	Model 2	362	1520	<.001	.76	.69	.67	.84	.12 (.10–.14)
	Model 3	383	1736	<.001	.82	.83	.82	.84	.10 (.09–.11)
Principal and Cultural	Model 4	520	567	<.001	.71	.73	.69	.74	.12 (.11–.13)

Note. Normed Fit Index = NFI, Tucker Lewis Index = TLI, Comparative Fit Index = CFI, Incremental Index of Fit = IFI, RMSEA = root mean square error of approximation, and CI = confidence interval.

Interestingly, the fit of Model 3 was improved greatly from that of Model 2, especially in regards to the cultural items, indicating that the combined variance of *Problem Solving* and *Orderly Environment* (in Model 2) lessened the fit to these data. This suggests that dividing out these two dimensions is probably good practice for researchers who investigate instructional leadership in the future. In other words, the effects of principal problem solving are worth investigating separately. Whilst my model of principal instructional leadership involves all seven dimensions, it acknowledges that all are deeply underpinned by a press for achievement. Dividing the dimensions into direct and indirect dimensions was undertaken so that the relative effects of these two groups of dimensions could be assessed in Study 2. The results depicted in Table 19 suggest that while Model 1 is the best fit, the strong performance of the more complex Model 3 suggests some validity in thinking about instructional leadership in this two-dimensional manner, whilst accepting that all factors are highly correlated (see Appendix D) and likely to be interdependent. As noted by Byrne (2001), the more complex the model, the worse the fit is likely to be.

Conclusion

This chapter described the process of developing a questionnaire to test the link between principal instructional leadership in a secondary school setting, school culture, and school performance. The purpose of the questionnaire was to clarify the typical nature of instructional leadership in secondary schools, and establish whether a distinct pattern was associated with effective schools (categorised as either higher-performing or *Improving Schools* in Study 1) as compared to others. This questionnaire drew on tools and dimensions developed by other researchers to create a tool that would test seven dimensions of instructional leadership and school culture. In order to test the hypothesis put forward in Chapter 1 that secondary school principals exert much of their influence via indirect instructional leadership and this is an effective means of impacting on school performance, these dimensions were defined as either direct or indirect instructional leadership. The aim was to test the efficacy of both direct and indirect instructional leadership on the part of principals and the relationship of these behaviours with the culture of schools.

The seven dimension model of principal instructional leadership used in this study was the best fit for the empirical data. When the model was divided into direct and indirect dimensions, the CFI fit of .90 was very nearly as good as that of the seven dimensional model (.91) even though this modification

made the model more complex. Both Model 1 and 3 had IFIs of .91 indicating that they are representative of a good fit and the cultural seven-dimensional model (Model 1) had a reasonable fit as indicated by a RMSEA of .07 (Byrne, 2001). Whilst there was a considerable amount of overlap in the dimensions, when used in the next part of the study (Chapter 5), it can be seen that there was sufficient discrimination to distinguish between behaviours.

Chapter 5: Assessing Principal Instructional Leadership in Secondary Schools—Study 2

The information gathered from the questionnaire (described in Chapter 4) forms the basis of Study 2; an analysis of teachers' perceptions of both their principals' instructional leadership and the culture of their schools. In this chapter, these findings are linked to the school performance results of Study 1 to establish patterns that cast light on the links between principal instructional leadership in secondary schools, school culture, and school performance. The results are examined using two different perspectives: Firstly, the outcome variable for school performance (*Performance Rating*—described in Chapter 2) is used, and then the outcome variable that assesses schools that improved most consistently over four years (*Improving Schools*) is used. While the results have some overlap, they appear to tell two differing stories about principal behaviour, school culture, and school performance.

Study 2 sought to answer two key questions:

Are there patterns in the instructional leadership practices of secondary schools that have been identified as effective (i.e., those that are higher-performing or *Improving*)?

How can differences in performance between schools that perform above and below the average for schools of a similar type be explained and to what extent does the instructional leadership of the principal contribute to these outcomes?

These questions were expanded into eight hypotheses based on findings in the literature review.

Hypothesis 1: Secondary school principals utilise more indirect instructional leadership than direct instructional leadership.

Hypothesis 2: The instructional leadership of principals of higher-performing schools and the culture of these schools, differ from those of other schools.

Hypothesis 3: Secondary school principals in higher-performing schools utilise direct instructional leadership to more effect (have stronger correlations with school performance ratings) than other principals.

Hypothesis 4: The instructional leadership of principals of *Improving Schools* and the culture of these schools, differ from those of other schools.

Hypothesis 5: Secondary school principals in *Improving Schools* utilise direct instructional leadership to more effect (have higher correlations with *Improving School* status) than principals of *Other Schools*.

Hypothesis 6: Principal instructional leadership is mediated by school culture.

Hypothesis 7: Community factors (SES, school size, transience of students) have greater effects on school performance than principal leadership factors (experience as head of department, deputy, or principal; service in the school) or principal instructional leadership.

Hypothesis 8: Teachers in English, mathematics, and science departments assess principal instructional leadership less favourably than other teachers.

Method

As this research was specifically focused on secondary school principalship and instructional leadership in those schools, it was decided to restrict the sample in Study 2 to those schools that included students in Years 7 to 13 within one of the four Ministry of Education districts—Central North. As I was a senior manager in the Ministry of Education with oversight of the schools in this sample, care was taken to ensure that principals did not feel pressured to participate in the research. Numerous steps were taken to mitigate this risk, including the provision of full details of what the research entailed (connecting performance and leadership) and ensuring that all questionnaires were returned to a third party who entered the data, thereby creating greater anonymity for principals (see Appendix E). This working relationship prohibited the use of some methods that would otherwise have been used to increase the possibility of a higher response rate, for example, phoning each principal to encourage participation in the research.

Participant Characteristics

Of the 102 schools that taught secondary school age students, 79 had the traditional secondary configuration of Years 7 or 9, to 13. Of the 79 in the possible sample, 30 returned consent forms allowing the research to be carried out in their schools. However, the teachers from one school did not return any questionnaires reducing the sample to 29 (37%) secondary schools. The sample had a higher percentage of high decile schools than the region's sample of 79 schools, but about the same percentage of low decile schools (see Table 20).

Table 20 Decile of Sample Schools versus Population

Decile	Population <i>N</i> = 79	% of 79	Sample <i>N</i> = 29	% of 29
Low	27	34%	11	38%
Middle	38	48%	9	31%
High	14	18%	9	31%

The sample of 29 schools also had a higher percentage of mid-performing schools than the wider sample and a smaller proportion of lower-performing schools (see Table 21).

Table 21 Performance of Sample Schools versus Population

Performance level	Population <i>N</i> = 79	% of 79	Sample <i>N</i> = 29	% of 29
Lower	18	23%	5	17%
Mid	39	49%	17	59%
Higher	22	28%	7	31%

The sample was also stronger in gaining *Improving* status than the wider population (13/29 or 45% compared with 30/79 or 38%). Thus, any generalisation from the results of this study to other New Zealand schools needs to be made with much caution as the sample tends to have a higher SES and be higher performing than the general population of secondary schools.

Principals

Seven principals in the sample were new to their schools during the previous two years. All had been in their schools for more than one year. Twenty-four of the 29 principals were male and five female. Only one had less than 10 years of teaching experience with 26 having more than 20 years teaching experience, and 19 having more than 10 years of experience as a principal. As a consequence, the experience of principals becomes an important potential moderator in the analyses.

Teachers

Every teacher in the participating schools was asked to answer the questionnaire. Ultimately, 651 teachers returned a usable questionnaire from a possible 1593. Questionnaires were distributed via principals, often by placement into cubby holes, teachers being requested to take a copy at a staff meeting, or by being left for teachers to take a copy from the staffroom after the option was made known. This represents a 38% return rate. The minimum returned from any one school was 5 out of a possible 12, with the maximum from a school being 44 (40%), and the average return rate per school being 22%. Given that comparative studies used as few as four randomly selected teachers per school (e.g., Heck, 1992), this convenience sampling approach was considered acceptable, particularly given the number of teacher responses. Sometimes analysis was reduced to 607 questionnaires when responses with missing data were excluded from analysis of variance calculations.

Measures and Covariates

The source of data for Study 2 was two questionnaires: one for the principal of a participating school and one for staff. The principals' questionnaire focused on the principal's previous experience and qualifications, the school's size, and community factors (socio-economic status and transience of students during the year). This questionnaire is attached as Appendix F.

The staff questionnaire was described in Chapter 4 and is attached as Appendix B. This questionnaire assessed principal instructional leadership (Items 1–10 and 41–50) and the culture of the school (Items 11–40). Both principal instructional leadership and cultural items were divided into direct and indirect behaviours and categorised as being one of seven dimensions (see Appendix C). In addition, some data were gathered about the teachers' experience levels and qualifications.

The outcome measures included two variables. The variable *Performance Rating* was a categorical measure of school performance. Schools were categorised as either higher-, mid-, or lower-performing (described in Chapter 2). The second outcome variable was an assessment of schools that were most consistently improving over four years—*Improving Schools* (also described in Chapter 2).

The questionnaires were analysed using SPSS software. The results of the analysis of the teacher responses are presented in a number of stages. In the first section, the instructional leadership behaviours of all principals are described to provide a picture of the typical behaviour of these secondary school principals and to test the first hypothesis that secondary school principals perform more indirect leadership behaviours. Two methods were used to assess typical behaviours; the average of dimensions and a comparison of principal and other leaders' frequency of use of ten items representing five of the seven dimensions: *Orderly Environment*, *Goals*, *Teaching and Curriculum*, *Professional Development*, and *Strategic Resourcing* (Appendix B, items 50–60).

In order to test Hypotheses 2 and 3, principal instructional leadership and school culture were compared across three levels of performance (higher-, mid-, and lower-performing). To test Hypotheses 4 and 5, patterns of instructional leadership in the 13 *Improving Schools* were compared to the 16 *Other Schools*. Then, structural models were created to test the direction of effects, and to assess whether principal instructional leadership was mediated by school culture, as proposed in Hypothesis 6. Next, multiple regression was used to calculate the relative effects of environmental factors (school size, decile, and transience of students), principal leadership factors (e.g., previous experience as a principal), principal instructional leadership, and cultural dimensions within the school. Finally, departmental differences in teacher perceptions were investigated in response to Hypothesis 7, which arose from findings by Rowan and colleagues (1991), that suggested that teachers in English, science, and mathematics departments gave lower ratings for principal instructional leadership than did other teachers.

Throughout the results section, the instructional leadership behaviours are divided into those that are deemed to be direct or indirect so that these two sets of behaviours can be compared. Analyses were carried out at both the individual teacher level ($N = 651$ or $N = 607$ when missing data required some to be excluded from analysis of variance) and the school level ($N = 29$). Minimum levels of responses used were as follows: From the five lower-performing schools, 101 teachers responded, 328 responded from the 17 mid-performing schools, and 178 responded from the seven higher-performing schools.

Results

Hypothesis 1: Secondary school principals use more indirect instructional leadership than direct instructional leadership.

In the literature review, I argued that principals in a secondary school environment were most likely to use indirect instructional leadership behaviours. An analysis of the means of the dimensions supports this hypothesis (see Table 22). All scores have a maximum of 5 representing *almost always* and a minimum of 1 representing *almost never*.

Table 22 Means of Principal Dimensions (N = 651)

	\bar{X}	SD
Indirect Dimensions		
Orderly Environment	4.02	0.83
Strategic Resourcing	3.97	0.77
Problem Solving	3.86	0.98
Average of indirect	3.95	
Direct Dimensions		
Goals	4.07	0.72
Professional Development	3.81	0.82
Teaching and Curriculum	3.52	0.85
Collective Responsibility	3.43	0.89
Average of direct	3.70	

The results from this sample of secondary schools using the Principal Dimension scores indicated that these principals tended to use *Goals* and *Orderly Environment* dimensions most, followed by *Strategic Resourcing*, *Problem Solving*, and *Professional Development* as their means of influencing the performance of the school. Two of the direct instructional leadership dimensions (*Teaching and Curriculum* and *Collective Responsibility*) were utilised least by these secondary school principals.

When the means were examined at school level (see Table 23), the pattern of results was the same. Using the first letters of these dimensions, this finding can readily be recalled by using the mnemonic GOSPP to represent the five instructional leadership behaviours used most commonly.

Table 23 Means of Principal Dimensions (N = 29)

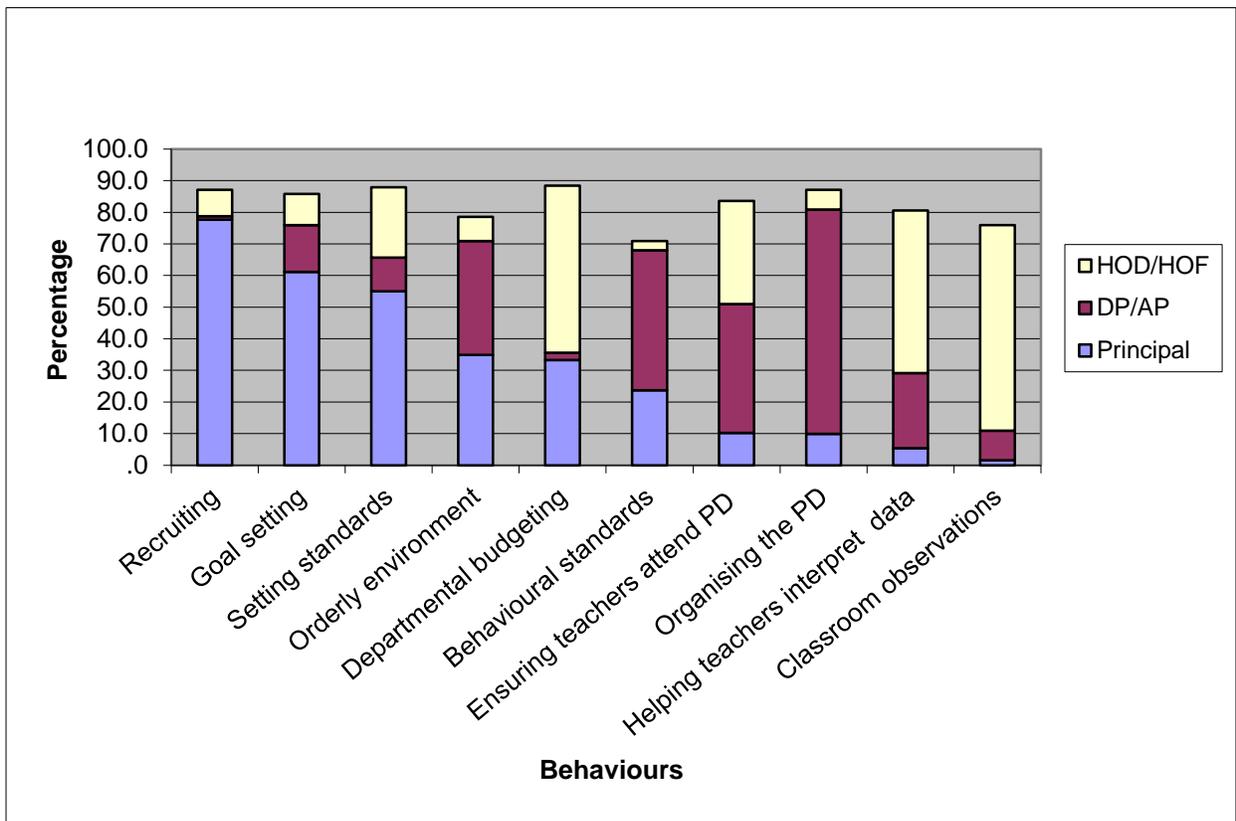
	\bar{X}	<i>SD</i>
Indirect Dimensions		
Orderly Environment	3.95	0.43
Strategic Resourcing	3.91	0.38
Problem Solving	3.78	0.52
Average of indirect	3.88	
Direct Dimensions		
Goals	4.02	0.35
Professional Development	3.78	0.39
Teaching and Curriculum	3.50	0.38
Collective Responsibility	3.42	0.38
Average of direct	3.68	

The predominance of the indirect behaviours for principals is also supported by the next analysis, which investigates the responses to questions 51–60 (See Appendix B) that sought to identify who in the school leadership team tended to carry out some core functions that were aligned to the five dimensions of Robinson and colleagues (2008).

As Figure 6 shows, principals were least likely to be named as being involved in *Teaching and Curriculum* activities shown as ‘Classroom observations’ (Item 56) and ‘Helping teachers interpret data’ (Item 55). Behaviours that were classed as *Teaching and Curriculum* were the domain of the heads of department or heads of faculty. Heads of department were most often named as those in charge of *Setting departmental budgets* (Item 51—*Strategic Resourcing*) also.

Most principals played significant roles in ‘Recruiting’ (Item 60—*Strategic Resourcing*), ‘Goal setting’ (Item 53—*Goals*), and ‘Standard setting’ (Item 54—*Goals*). Principals shared with deputies duties centred on an ‘Orderly environment’ (Item 52—*Orderly Environment*). Deputy principals mainly took responsibility for professional development items: ‘Organising the PD’ (Item 58) and ‘Ensuring teachers attend PD’ (Item 57).

Figure 6 Percentage of Teachers Reporting Leadership Activity by Role (N = 651)



These findings are consistent with the literature review that indicated that most direct supervision of secondary teachers *Teaching and Curriculum* practices is carried out by heads of departments and that professional development is also frequently a departmental activity. Taken with the results previously reported, Hypothesis 1: Secondary school principals utilise more indirect instructional leadership than direct instructional leadership is supported. On average, these 29 principals utilised more indirect leadership whether the results were analysed at the individual teacher or school level. An analysis of roles showed principals were heavily involved in goal setting type behaviours, setting standards, and recruiting teachers. They shared responsibility for maintaining an orderly environment with deputies, but professional development was largely the domain of deputies and heads of departments.

Hypothesis 2: The instructional leadership of higher-performing schools and the culture of these schools, differ from those of other schools.

Next, items 1 to 50 were analysed for the extent of differences in principal instructional leadership by dimension means at both teacher and school level. Principals in higher-performing schools were consistently rated higher than all other principals, but surprisingly, the five principals of the lower-performing schools were usually rated more positively than those in the 17 mid-performing schools. As Figure 7 and Figure 8 show, differences between higher-performing and other schools were most evident in the indirect dimensions regardless of whether these were analysed at the teacher ($N = 651$) or school ($N = 29$) level.

The pattern of results indicates that in this sample at least, the five principals in the lower-performing schools were perceived to be utilising more direct and indirect instructional leadership than the 17 principals of mid-performing schools. This result is attributed to the nature of the self-selecting sample of principals, and is thought likely to be a characteristic of the five principals in the lower-performing schools. Two principals had taken up their roles within the previous two years and were clearly making improvement efforts, and one of the five principals was in a school already rated as *Improving*. Thus, this sample of lower-performing schools is likely to be more positively biased than the general population of schools in that group. Nevertheless, these results indicate the worthiness of examining three levels of performance and not just the outlier high and low groups—a point made by Heck (1992). In this case, differences are greatest between the principals in schools categorised as higher- and mid-performing.

Figure 7 Mean Scores of Principal Dimensions by Performance Rating (N = 651)

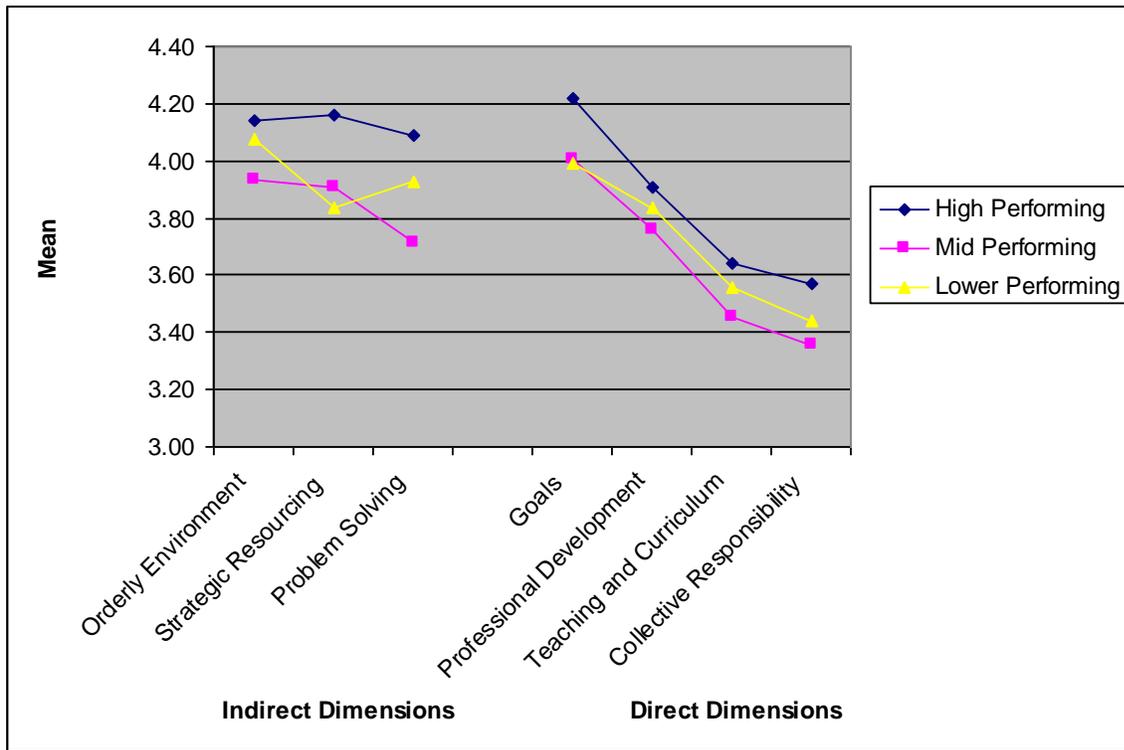


Figure 8 Mean Scores of Principal Dimensions by Performance Rating (N = 29)

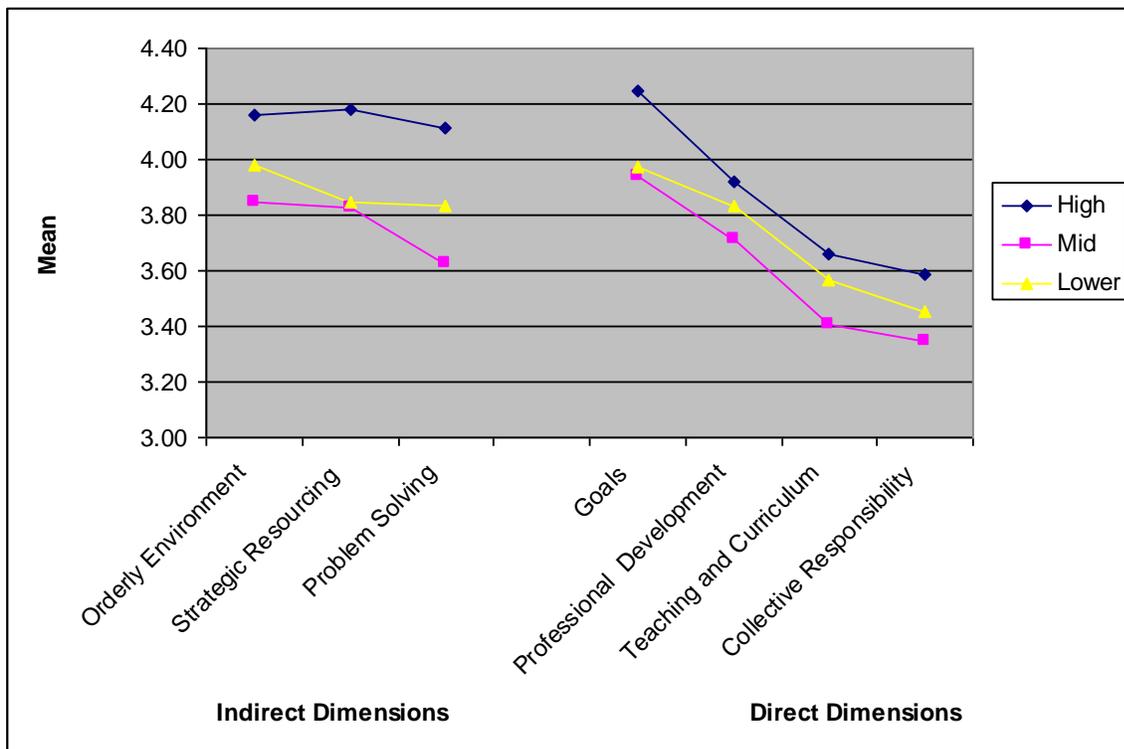
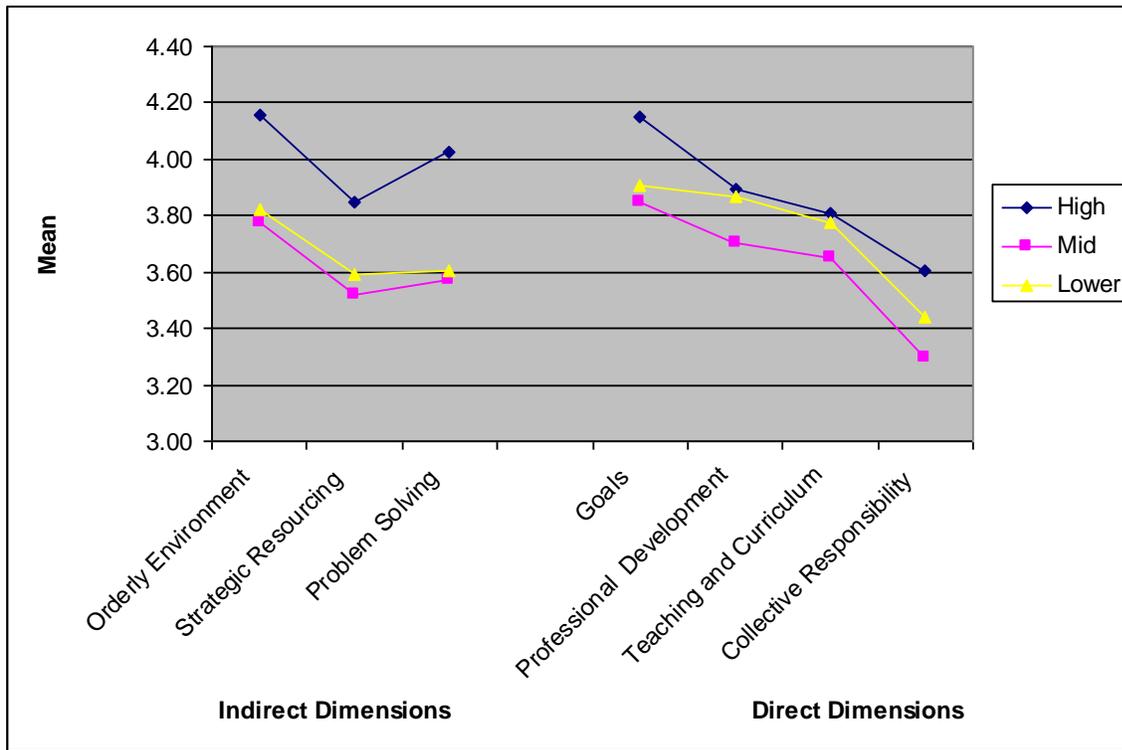


Figure 9 Mean Scores of Cultural Dimensions by Performance Rating ($N = 29$)



When the cultures of these schools were examined, a similar result was obtained regardless of whether analysis was at the teacher level ($N = 651$) or the school level ($N = 29$). Figure 9 shows that the culture of higher-performing schools differed from other schools and again it was the three indirect dimensions where differences were most evident between higher- and mid-performing schools, largely reflecting the pattern found in the principal dimension results (See Appendix C for items by dimension). In the direct dimensions, it was *Goals* and *Collective Responsibility* where differences were most evident.

Next, a multivariate analysis of variance (MANOVA) was estimated using all the individual items on the teacher questionnaire, rather than the dimensions. Statistically significant differences were evident across the means of these three groups of schools (Wilks Lambda = .015, Mult. $F = 614.363$, $df = 50, 466$, $p < .001$).

Ten of the 13 items that most contributed to this overall difference ($p < .01$) were cultural items (coded with a C in Table 24). Consistent with the results just reported, the items that differentiated most

between groups included all four of the *Cultural-Orderly Environment* items, all four *Problem Solving* items (two cultural and two for the principal) and two items from the *Goals* dimension. Items that specifically referred to the principal, involved only *Problem Solving* and *Goals* dimensions. The rest pertained to the culture of the school.

Table 24 Items with the Largest Differences between Schools of Varying Performance Levels

Item	df	Mean Square	F	Sig.	Low	SD	Mid	SD	High	SD
C OE 21 Student discipline problems are handled with fairness, emphasising behaviour, not personality.	2	10.695	13.129	.000	3.77	.965	3.98	.944	4.35	.807
P G 3 Principal promotes school goals that specify high standards and expectations for all students.	2	5.459	12.311	.000	4.40	.664	4.42	.738	4.72	.531
C OE 11 Staff work in a safe, supportive, and orderly environment.	2	8.962	11.871	.000	3.98	.878	3.98	.925	4.37	.767
C PS 39 Problems of teachers, students, and parents are resolved appropriately.	2	10.683	11.745	.000	3.60	.931	3.62	.998	4.05	.887
C OE 12 Staff assume responsibility for all students' learning.	2	5.510	8.987	.000	3.85	.807	3.88	.816	4.18	.718
P PS 49 Principal ensures problems of teachers, students, and parents are resolved.	2	7.395	7.433	.001	3.97	.991	3.74	1.057	4.11	.897
C SR 30 Resources are fairly allocated to support teachers' efforts to improve learning.	2	6.657	6.956	.001	3.60	.896	3.59	1.026	3.93	.926
C CR 31 Teachers who are not serving students well are challenged to improve.	2	5.893	5.548	.004	3.50	.937	3.23	1.077	3.55	.985
C SR 29 Useful teaching resources are provided for teachers.	2	4.229	5.249	.006	3.69	.759	3.65	.938	3.93	.875
C G 13 Staff has a shared commitment to the school's academic goals.	2	3.244	4.992	.007	4.11	.791	4.01	.840	4.26	.754
P PS 50 Principal ensures that staff issues are taken seriously but are balanced with the need	2	5.524	4.883	.008	4.08	.997	3.71	1.112	3.97	1.005

to serve the students well.

C OE 22 Instructional time is protected from interruptions.	2	4.412	4.869	.008	3.29	.837	3.25	1.009	3.53	.894
C PS 40 Staff issues are taken seriously but are balanced with the need to serve the students well.	2	4.622	4.686	.010	3.82	.897	3.65	1.036	3.94	.954

Note. C = Cultural Dimension, P = Principal Dimension, G = Goals, OE = Orderly Environment, SR = Strategic Resourcing, C R = Collective Responsibility, PD = Professional Development, and PS = Problem Solving.

As interesting are the 10 items that were most similar across the three types of schools (see Table 25). All of these items that did not differentiate between the three groups of schools are indicators of direct instructional cultures or direct instructional behaviour by the principal. Some of the reasons for this result appear to be that principals in the lower-performing schools were rated most highly on Items 34, 8, 37, 7, and 42, and were rated the same as principals in higher-performing schools in Item 44 and almost the same for Item 25. Thus, the mean of the direct behaviours of the principals in lower-performing schools was frequently higher than, or on a par with, that of higher-performing schools.

Table 25 Items with the Smallest Differences between Schools of Varying Performance Levels

Item	<i>df</i>	Mean Square	<i>F</i>	Sig.	Low	<i>SD</i>	Mid	<i>SD</i>	High	<i>SD</i>
C G 34 Departmental goals are set based on information about what students need to know and be able to do.	2	.696	.853	.427	4.03	.849	3.89	.963	3.98	.821
P PD 8 Principal is an active participant in professional development with teachers.	2	.793	.793	.453	4.18	.984	4.03	1.052	4.13	.917
C TC 25 Teachers are helped to interpret assessment data for instructional implications.	2	.706	.780	.459	3.55	.899	3.45	.968	3.56	.942
C PD 37 Professional development focuses on the relationship between what is taught and what is learnt.	2	.596	.694	.500	3.58	1.001	3.46	1.008	3.55	.747
P PD 7 Principal encourages teachers to attend professional development that is aligned to school goals.	2	.539	.618	.539	4.27	.995	4.15	.948	4.22	.887
P CR 42 Principal encourages teachers to take responsibility not only for their own actions and	2	.634	.605	.546	3.39	1.092	3.26	1.041	3.35	.969

students, but also for those of others.

C CR 32 Leadership ensures teachers take responsibility not only for their own actions and students, but also for those of others.	2	.437	.566	.568	3.35	.812	3.35	.899	3.44	.866
P G 44 Principal ensures departmental goals are based on information about what students need to know and be able to do.	2	.482	.448	.639	3.53	.918	3.44	1.059	3.53	1.042
C TC 36 Leadership ensures teachers help each other by discussing their students' results and developing more effective teaching strategies.	2	.186	.220	.803	3.81	.884	3.81	.934	3.86	.909
P- TC 46 Principal helps teachers discuss their students' results with others and collaboratively seek ways to improve outcomes.	2	.209	.177	.838	3.29	1.122	3.25	1.123	3.31	1.013

Note. C = Cultural Dimensions, P = Principal Dimensions, G = Goals, TC = Teaching and Curriculum, C R = Collective Responsibility, and PD = Professional Development.

Next, the effect sizes of the cultural dimensions were calculated. An effect size quantifies the difference between two groups indicating how large the effect of a treatment is (Cohen, et al., 2007). The protocols that are used here are the same as those applied by Hattie (2009b). That is, .2 is considered small, .4 moderate, and .6 large. Hattie (2009b) found .35 to be the effect of an average year's teaching in reading, writing, and mathematics for a large sample of New Zealand primary and secondary school students. Hattie also pointed out that small effects can be important, particularly if they are not costly to implement. Thus, there is more to consider with effects, than the size.

When higher- and mid-performing schools were compared (see Table 26), Cultural Dimensions had mainly significant effects, and it was the indirect behaviours along with *Goals* and *Collective Responsibility* that had the strongest effects with *Cultural-Orderly Environment* (0.55), *Cultural-Problem Solving* (0.45), *Cultural-Goals* (0.42), *Cultural-Strategic Resourcing* (0.38) and *Cultural-Collective Responsibility* (0.33) all having moderate effects.

Table 26 Effect Sizes of Cultural Dimensions in Higher- and Mid-performing Schools

Cultural Dimensions	<i>d</i>	<i>F</i>	<i>df</i>	<i>p</i>	Order
Indirect Dimensions					
Orderly Environment	0.55	36.567	1,542	<.001	1
Strategic Resourcing	0.38	18.222	1,542	<.001	4
Problem Solving	0.45	19.938	1,542	<.001	2
Direct Dimensions					
Goals	0.42	17.355	1,542	<.001	3
Professional Development	0.18	3.440	1,542	NS	6
Teaching & Curriculum	0.14	2.182	1,542	NS	7
Collective Responsibility	0.33	15.659	1,542	<.001	5

When higher- and lower-performing school cultures were compared (see Table 27), the moderate effect sizes for the indirect cultural dimensions still suggested that higher-performing schools were characterised by more orderliness, good staff appointments, strategic use of material resources, problem solving behaviour, and effective goal setting and collective responsibility than lower-performing schools. The *Professional Development* and *Teaching and Curriculum* dimensions were not significant. When calculated at the school level (not shown), once again most results were not significant with the exception of *Orderly Environment* ($p < .05$).

Table 27 Effect Sizes of Cultural Dimensions in Higher- and Lower-performing Schools

Cultural Dimensions	<i>d</i>	<i>F</i>	<i>df</i>	<i>p</i>	Order
Indirect Dimensions					
Orderly Environment	0.53	17.707	1,296	<.001	1
Strategic Resourcing	0.48	16.687	1,296	<.001	2
Problem Solving	0.43	11.635	1,293	=.001	3
Direct Dimensions					
Goals	0.39	8.816	1,296	<.01	4
Professional Development	0.04	.175	1,296	NS	6
Teaching & Curriculum	-0.02	.007	1,296	NS	7
Collective Responsibility	0.26	5.519	1,291	<.05	5

So overall, when school performance (*Performance Rating*) was the outcome variable, principals and cultures of higher-performing schools were rated more highly than others, with *Goals*, *Orderly Environment*, *Strategic Resourcing*, *Problem Solving*, and *Collective Responsibility* appearing to differentiate most between this group of schools and the others. Effect sizes were moderately high for the three indirect cultural dimensions and for *Goals* and *Collective Responsibility*. From these analyses I concluded that Hypothesis 2 was supported. The instructional leadership of principals of higher-

performing schools and the culture of these schools differed from that of other schools. They were distinguished by their goal focus, their degree of orderliness, strategic resourcing, problem solving, and collective responsibility.

Hypothesis 3: Secondary school principals in higher-performing schools utilise direct instructional leadership to more effect (have stronger correlations with school performance ratings) than other principals.

Next, the effect sizes were calculated to assess the impact of the differing instructional leadership behaviours on the part of principals. Many studies of this kind only consider the outliers (higher- and lower-performing schools). In this study, principals of the mid-performing schools were also of interest and as has been seen, they scored lower on instructional leadership than the principals in the lower-performing schools. For this reason, the differences between higher- and mid-performing are first analysed as these differed most when means were examined. Higher- and lower-performing schools are also compared, so sample specific similarities and differences can be assessed.

Table 28 Effect Sizes of Principal Dimensions in Higher- and Mid-performing Schools

	<i>d</i>	<i>F</i>	<i>df</i>	<i>p</i>	Order
Indirect Dimensions					
Orderly Environment	0.28	7.792	1,530	<.01	4
Strategic Resourcing	0.36	13.950	1,532	<.001	2
Problem Solving	0.41	17.957	1,537	<.001	1
Direct Dimensions					
Goals	0.31	11.418	1,541	=.001	3
Professional Development	0.17	4.070	1,541	<.05	7
Teaching & Curriculum	0.21	5.780	1,541	<.05	6
Collective Responsibility	0.24	6.959	1,523	<.01	5

As can be seen in Table 28, when the effect sizes for higher- and mid-performing schools were calculated at the teacher level, the effects of principal instructional leadership were greatest for *Problem Solving*, *Strategic Resourcing*, and *Goals*, with *Problem Solving* being the only dimension to have a moderate effect. The smallest effects were for *Collective Responsibility*, *Teaching and Curriculum*, and *Professional Development*. Problem solving on the part of the principal had the strongest effect however, at 0.41. Results calculated at the school level (*N* = 24) mirrored the overall pattern of results but were not significant due to the small sample size.

Having found a consistent pattern of effect sizes to distinguish higher- and mid-performing schools regardless of the level of analysis, the differences between higher- and lower-performing schools were then examined. These were even more interesting as principals in lower-performing schools were sometimes out-rating the principals of higher-performing schools, particularly on direct instructional leadership behaviours.

But as Table 29 indicates, when effect sizes were calculated between higher- and lower-performing schools, principals in higher-performing schools still gained most effects from *Strategic Resourcing* and *Goals*.

Table 29 Effect Sizes of Principal Dimensions in Higher- and Lower-performing Schools

	<i>d</i>	<i>F</i>	<i>df</i>	<i>p</i>	Order
Indirect Dimensions					
Orderly Environment	0.13	.581	1,290	NS	5
Strategic Resourcing	0.44	13.107	1,295	<.001	1
Problem Solving	0.16	2.265	1,291	NS	3
Direct Dimensions					
Goals	0.36	7.906	1,297	<.01	2
Professional Development	0.11	.588	1,296	NS	7
Teaching & Curriculum	0.11	.713	1,296	NS	7
Collective Responsibility	0.15	1.591	1,284	NS	4

To summarise the results, Table 30 is presented showing the dimensions most highly related to performance. Principal instructional leadership effects were consistently greatest in *Problem Solving*, *Strategic Resourcing*, and *Goals* (PSG).

Table 30 Largest Effect Sizes for Principal Instructional Leadership

Effect sizes	Highest	Second Highest	Third Highest	<i>N</i>
Higher-Lower	SR 0.44	G 0.36	PS 0.16/CR 0.15	279
Higher-Mid	PS 0.41	SR 0.36	G 0.31	506

Note: G = Goals, SR = Strategic Resourcing, CR = Collective Responsibility, and PS = Problem Solving.

The cultures of higher-performing schools, on the other hand, were consistently characterised by *Orderly Environment* and *Problem Solving* as Table 31 shows, though all three indirect dimension effects, as well as *Goals* and *Collective Responsibility*, had moderately large, significant effects.

Table 31 Largest Effect Sizes for Cultural Dimensions

Most Effects	Highest	Second Highest	Third Highest	N
Higher-Lower	OE 0.53	SR 0.48	PS 0.43	279
Higher-Mid	OE 0.55	PS 0.45	G 0.42	506

Note. G = Goals, OE = Orderly Environment, SR = Strategic Resourcing, and PS = Problem Solving.

Results across different groups at the individual teacher level are summarised in Appendix G where they are compared to the findings of Robinson and colleagues (1998). Cultural effects are summarised in Appendix H. Overall, the results suggest that principals in these higher-performing schools have most impact on school performance through the use of goals, a problem solving focus, and strong strategic resourcing. While the *Goals* dimension appears to be powerful leadership behaviour in all schools, the two other direct behaviours were rated stronger in lower-performing schools and had smaller effect sizes and in some cases were not significant. Item analysis clearly showed that principals in the lower-performing schools had higher means on some direct instructional leadership behaviours than the two other groups of principals. These results did not support Hypothesis 3 that expected direct instructional leadership to be used to most effect in higher-performing schools.

Hypothesis 4: The instructional leadership of principals of Improving Schools and the culture of these schools differ from those of other schools.

The pattern of analysis that was carried out for school performance was repeated, but this time utilising the outcome variable *Improving Schools* in order to test Hypotheses 4 and 5. These results told a different story to those of the school performance variable.

When the means of the Improving Schools were compared to those of the Other Schools there was a pattern of higher means for the improving schools over others, but this time it was *Goals* along with *Teaching and Curriculum*, and *Collective Responsibility*, where differences were most evident regardless of whether analysis was at the individual teacher or school level or whether it was the principal or cultural dimensions that were examined (see Figures 10, 11, 12, and 13).

Figure 10 Mean Scores of Principal Dimensions of *Improving School* and *Others* (N = 651)

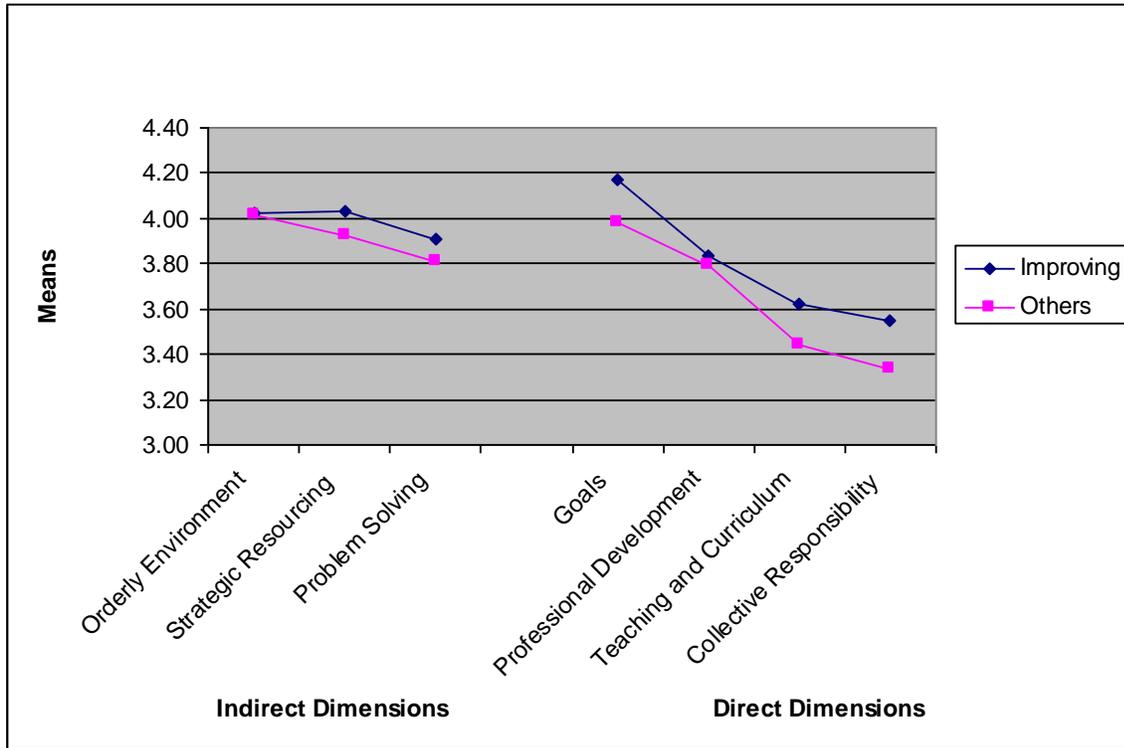


Figure 11 Mean Scores of Principal Dimensions for *Improving Schools* and *Others* (N = 29)

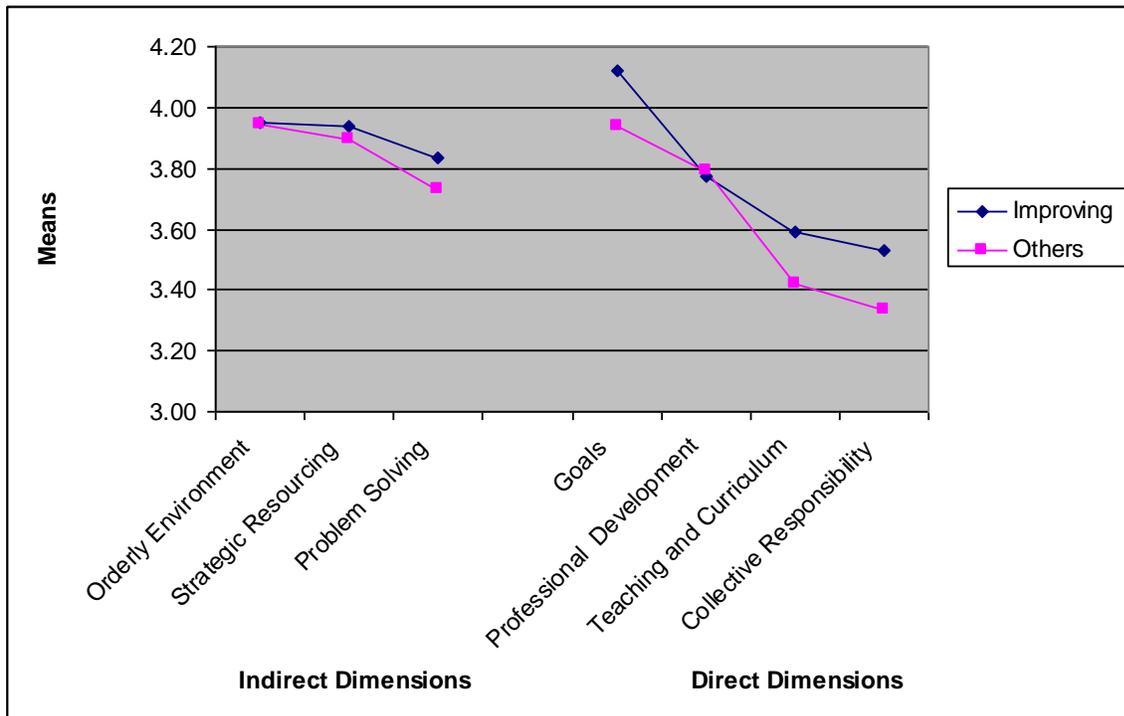


Figure 12 Mean Scores of Cultural Dimensions of *Improving Schools* and *Others* (N = 651)

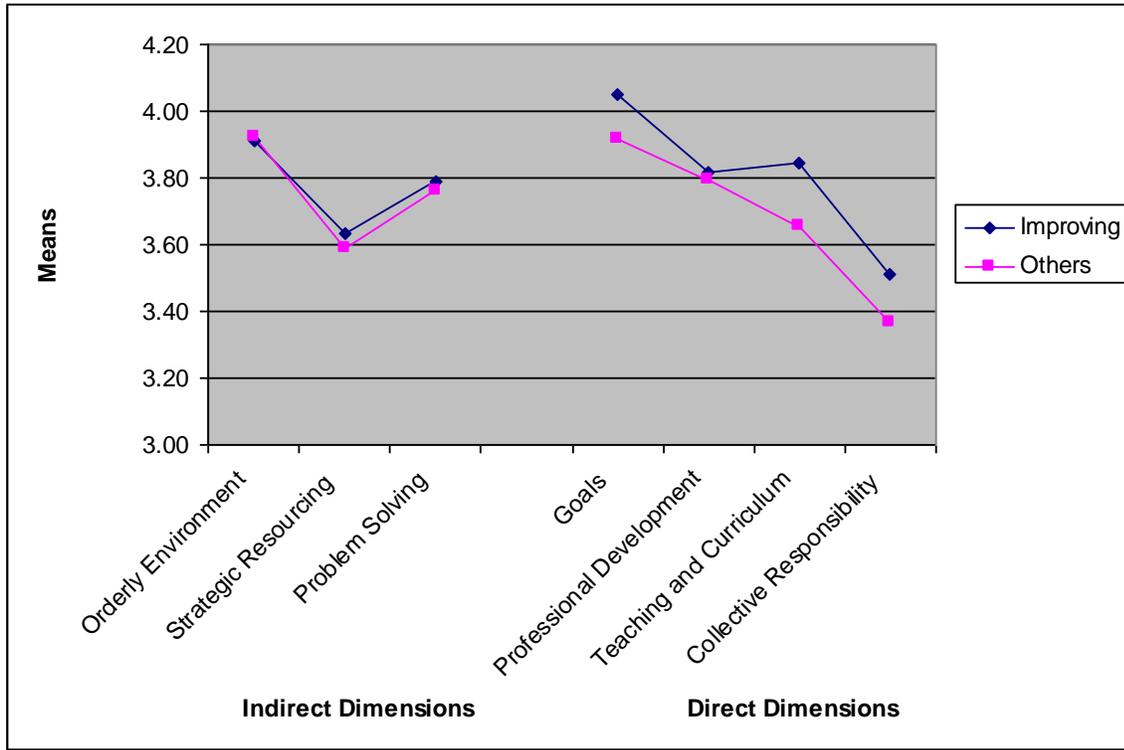
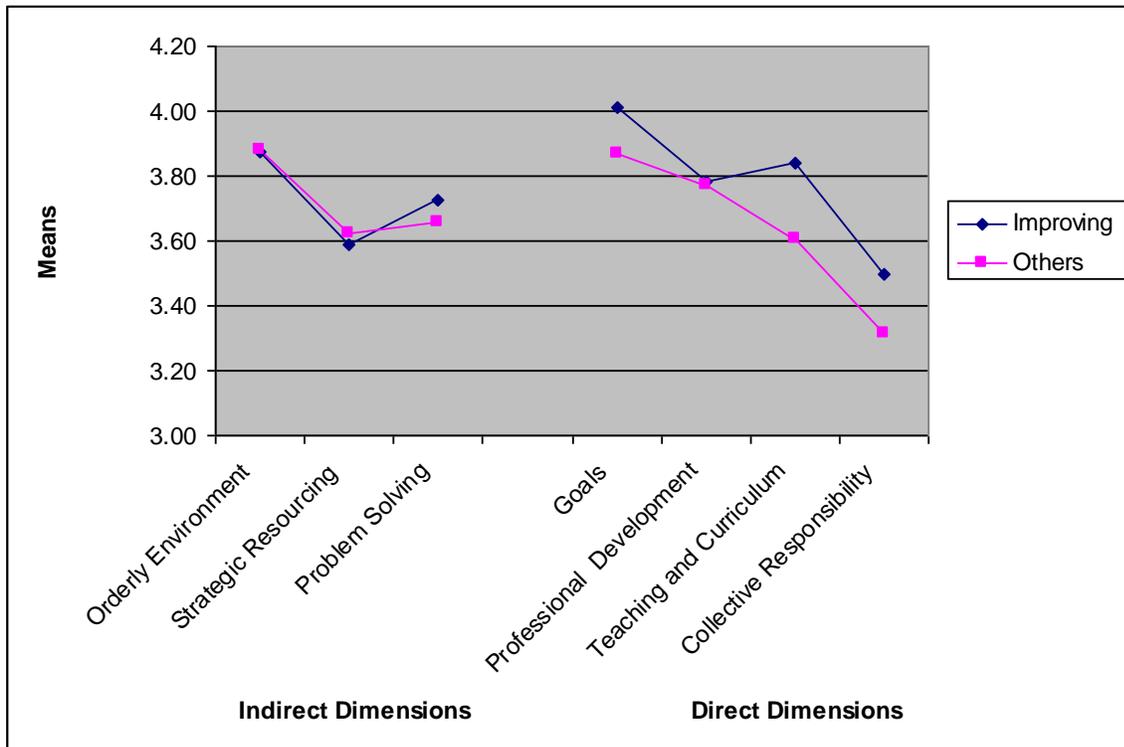


Figure 13 Mean Scores of Cultural Dimensions of *Improving Schools* and *Others* (N = 29)



In each of these graphs (Figures 10, 11, 12, and 13) it can be seen that these results support Hypothesis 4: The instructional leadership of principals of *Improving Schools* and the culture of these schools, differed from that of other schools. How they differed is more interesting.

When *Performance Rating* was the outcome variable, it was *Goals*, *Problem Solving*, and *Strategic Resourcing* dimensions that differentiated most between principal dimensions, along with cultures strong in *Orderly Environment* and *Problem Solving* dimensions. But when the outcome variable was *Improving Schools*, it was *Goals*, *Teaching and Curriculum*, and *Collective Responsibility* (three of the four direct dimensions) that differentiated most regardless of whether it was the cultural or principal dimensions that were examined. Notably, however, the effect sizes for these latter dimensions were about the same regardless of which outcome variable was used.

When effect sizes for the Cultural Direct dimensions were calculated (see Table 32) three of the four were found to have small but significant effects: *Teaching and Curriculum* (0.23), *Goals* (0.21), and *Collective Responsibility* (0.19).

Table 32 Effect Sizes of Cultural Dimensions for Improving Schools and Others

Cultural Dimensions	<i>d</i>	<i>F</i>	<i>df</i>	<i>p</i>
Indirect				
Orderly Environment	-.04	.059	1,648	NS
Strategic Resourcing	0.03	.541	1,648	NS
Problem Solving	0.19	.151	1,648	NS
Direct				
Goals	0.21	6.839	1,648	<.01
Professional Development	0.00	.203	1,648	NS
Teaching & Curriculum	0.23	10.871	1,648	=.001
Collective Responsibility	0.19	6.119	1,648	<.05

These results suggest that both the leadership team and the staff (as revealed by the cultural dimensions) in these schools were distinguished from other schools by their use of the *Goals* and *Teaching and Curriculum* dimensions and that they nurtured a culture of *Collective Responsibility* to gain improvement. The Indirect Cultural dimensions, were, by contrast, not significant.

A multivariate anova (MANOVA) was then estimated using all the individual items on the teacher questionnaire, and the dependent variable *Improving School* as the outcome variable. There were statistically significant differences across the means of these groups of schools (Wilks Lambda = .83, Mult. $F=1.98$, $df=50, 467$, $p < .001$). The items that most contributed to this overall difference (with $p \leq .01$), were all from *Principal-Goals* and *Culture-Teaching and Curriculum* (see Table 33).

These items highlight the principal's role in setting high and attainable goals, and a school culture that does not accept home environment as a reason to not succeed but one that is focused on using data to improve teaching (Item 35), and where teachers help each other by discussing their students' results and developing more effective teaching strategies (Item 36). These schools also use classroom observations that focus on the link between outcomes and teaching (Item 26). Teachers are helped to interpret assessment data for instructional purposes (Item 25), but notably, observing teachers in classrooms for appraisal purposes (Item 26) favoured *Other Schools*. These items are a stark contrast to the results when *Performance Rating* was the outcome variable. Now we see clearly that some direct instructional leadership behaviours on the part of both the principal and the wider leadership team are strongly associated with schools that are improving as opposed to those that are higher-performing, though not all direct instructional behaviours.

Table 33 Items with the Greatest Differences between Improving Schools and Others

Item	<i>df</i>	Mean Square	<i>F</i>	Sig.	Improving	<i>SD</i>	Others	<i>SD</i>
P G 3 Principal promotes school goals that specify high standards and expectations for all students.	1	3.25	7.11	.008	4.61	.620	4.45	.720
P G 4 Principal communicates the school's goals in clear, concrete terms.	1	5.90	7.11	.008	4.31	.929	4.10	.895
P G 43 Principal challenges teachers to not dismiss inability to reach school goals as an inevitable consequence of home environment.	1	6.59	6.38	.012	3.76	1.034	3.53	1.002
C TC 35 Leadership ensures	1	4.89	5.96	.015	3.83	.918	3.63	.896

assessment data are used to improve teaching.

C TC 36 Leadership ensures teachers help each other by discussing their students' results and developing more effective teaching strategies.	1	4.87	5.82	.016	3.93	.911	3.74	.918
C TC 26 Classroom observations that focus on the link between outcomes and teaching are carried out for appraisal purposes.	1	5.90	5.79	.016	3.70	.953	3.79	.862
C TC 25 Teachers are helped to interpret assessment data for instructional implications.	1	5.04	5.63	.018	3.61	.960	3.41	.936

Note. C = Cultural Dimensions, P = Principal Dimensions, G = Goals, and TC = Teaching and Curriculum.

These results along with the previous effect sizes tend to suggest that in *Improving Schools* the principal's role in setting high standards (*Goals*), encouraging a sense of collective responsibility (*Collective Responsibility*), and using data to set and monitor targets (*Teaching and Curriculum*) are the types of behaviours that are most effective for *Improving Schools*. These results support Hypothesis 5: That principals in *Improving Schools* utilise direct instructional leadership to gain effect. The nature of items 25, 26, 35, and 36 (all *Cultural-Teaching and Curriculum* items) also suggest that the wider management team and staff are focused on data use and sound curriculum delivery in schools that are improving.

Table 34 shows that the items that did not distinguish between these groups included four *Professional Development* items (28, 27, 37, 7) suggesting that it is not professional development per se that differentiates between these schools, as much as the use of data, appropriate goal setting, the monitoring of classroom practices by the leadership team, and the discussions teachers have about these results. These *Professional Development* findings are a contrast to high effect sizes in the research of Robinson and colleagues (2008). In the study by Robinson and colleagues, the large effect size for leading professional development was obtained from measures of school-wide leadership, not just principal leadership. It is probably reasonable to conclude that the principals do not take a leading role in professional development. It is likely to be the role of a deputy as was seen in the role analysis data used to answer Hypothesis 1 (see Figure 6).

Hypothesis 4 was supported therefore: The instructional leadership of principals of *Improving Schools* and the culture of these schools differed from that of other schools. *Improving Schools* had higher scores on principal and cultural dimensions in the *Goals, Teaching and Curriculum*, and *Collective Responsibility* dimensions, and significant effects were established between three of the four Cultural Direct dimensions (with the exception of *Professional Development*) and *Improving* status.

Table 34 Items with Least Differences between Improving Schools and Others

Item <i>N</i>	<i>df</i>	Mean Square	<i>F</i>	Sig.	Improving	<i>SD</i>	Others	<i>SD</i>
C PD 28 Professional development is planned with a focus on the school's academic goals.	1	.163	.216	.642	3.96	.940	3.92	.805
P SR 9 Principal makes sure that appropriate resources for effective instruction are provided.		.131	.153	.696	4.00	.976	3.97	.882
C G 13 Staff has a shared commitment to the school's academic goals.	1	.067	.102	.750	4.12	.837	4.10	.792
C OE 12 Staff assume responsibility for <i>all</i> students' learning.	1	.031	.050	.824	3.99	.812	3.97	.782
C PD27 Professional development is planned around the needs of students.	1	.025	.027	.869	3.69	1.019	3.68	.923
C PD 37 Professional development focuses on the relationship between what is taught and what is learnt.	1	.009	.011	.918	3.51	.965	3.50	.894
P PD 7 Principal encourages teachers to attend professional development that is aligned to school goals.	1	.001	.001	.980	4.19	.967	4.18	.906

Note. C = Cultural Dimensions, P = Principal Dimensions, G = Goals, SR = Strategic Resourcing, and PD = Professional Development.

Hypothesis 5: Secondary school principals in Improving Schools utilise direct instructional leadership to more effect (have higher correlations with Improving School status) than principals of Other Schools.

Analysis also supported the fifth hypothesis. The same three Principal Direct dimensions as the aforementioned Cultural Direct dimensions were found to have small but significant effects on *Improving Schools* (see Table 35).

Table 35 Effect Sizes of Principal Dimensions for Improving Schools and Others

	<i>d</i>	<i>F</i>	<i>df</i>	<i>p</i>
Indirect Dimensions				
Orderly Environment	0.00	.024	1,633	NS
Strategic Resourcing	0.13	2,739	1,637	NS
Problem Solving	0.11	1,624	1,642	NS
Direct Dimensions				
Goals	0.26	11,264	1,647	=.001
Professional Development	0.04	.373	1,647	NS
Teaching and Curriculum	0.19	7,183	1,647	<.01
Collective Responsibility	0.23	9,010	1,627	<.01

When effect sizes were calculated at the school level (not shown) they were considerably larger though again, due to small numbers, only *Cultural-Teaching and Curriculum* was significant. Most importantly, the same pattern prevailed with the significant effects in *Improving Schools* coming from *Goals*, *Teaching and Curriculum*, and *Collective Responsibility*. A summary of these results for *Improving Schools* is presented in Table 36.

Table 36 Principal and Cultural Effects for Improving Schools and Others

	Highest	Second Highest	Third Highest	<i>N</i>
Principal Effects	G 0.26	CR 0.23	TC 0.19	651
Cultural Effects	TC 0.23	G 0.21	CR 0.19	651

Note. G = Goals, C R = Collective Responsibility, and TC = Teaching and Curriculum.

Thus, while Hypothesis 3: Secondary school principals in higher-performing schools utilise direct instructional leadership to more effect than other principals was not supported, Hypothesis 4 (The instructional leadership of principals of *Improving Schools* and the culture of these schools, differ from those of other schools) and Hypothesis 5 (Secondary school principals in *Improving Schools* utilise direct instructional leadership to more effect than principals of *Other Schools*) were supported. These results

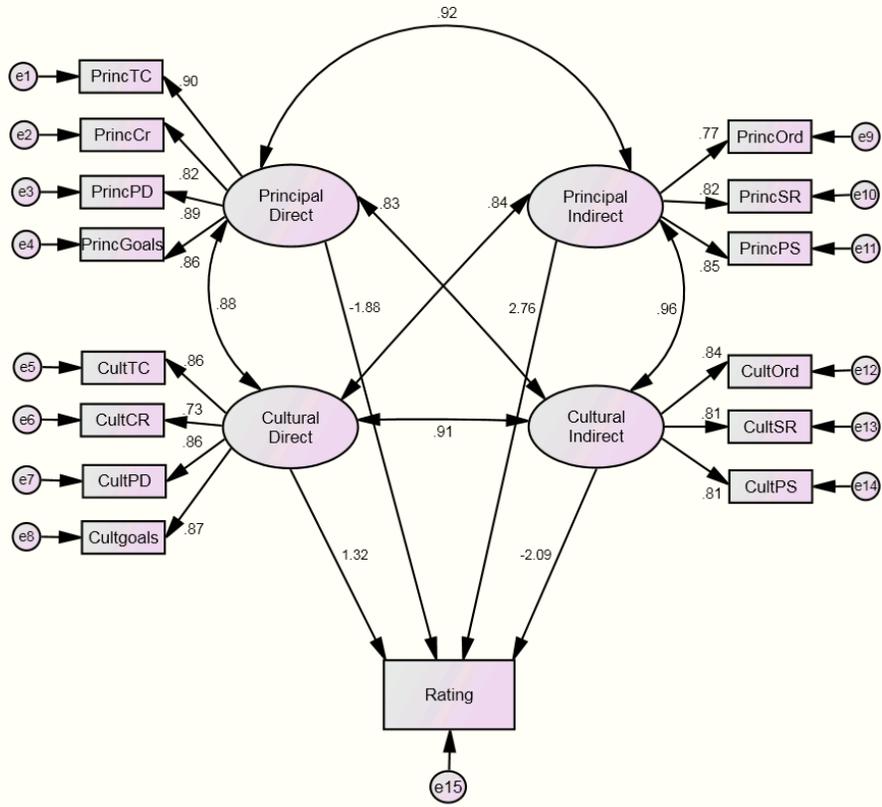
suggest that three direct instructional leadership dimensions (*Goals, Teaching and Curriculum, and Collective Responsibility*) are associated with gaining improvement with small but significant effects whether it is the principal's behaviour or the behaviours of teachers and the wider leadership team (Cultural Dimensions) collectively.

To sum up thus far, while effective schools differ from others, the various comparisons between higher- and lower-performing schools, higher- and mid-performing schools, and *Improving* and *Others*, did not always show a consistent pattern of differences. Principals in higher-performing and other schools differed in the degree they used indirect instructional leadership to effect. Principals in higher-performing schools used *Goals* along with two indirect instructional leadership to most effect, (*Problem Solving* and *Strategic Resourcing*), and had cultures that were strong in *Orderly Environment* and *Problem Solving*. Principals in *Improving Schools* used *Goals* along with *Teaching and Curriculum* and *Collective Responsibility* to most effect, and had cultures that were also strong in these same dimensions. Whether they were already higher-performing or improving, the major consistency in results supports the use of high expectations and data-driven goals by the principal—the use of the *Goals* dimension. Principals in higher-performing and improving schools are good at setting and communicating goals. Interestingly, these three dimensions (*Goals, Teaching and Curriculum, and Collective Responsibility*) had small but significant effects regardless of whether the outcome variable was school performance or improvement.

Hypothesis 6: Principal instructional leadership is mediated by school culture.

Next, structural models were developed to test the direction of effects. A structural model was developed specifying that the Principal Direct and Indirect influences on the overall rating of the school (higher-, mid-, or lower-performing) is mediated by the Cultural Direct and Indirect instructional leadership influences. For a good fit, RMSEA should be < .08 and NFI should be >.9. The results for this model suggest they are a reasonable fit ($\chi^2 = 694.46$, $df = .81$, RMSEA .108, NFI .918). The most important finding (see Figure 14) is the negative relationship for direct instructional leadership and positive for indirect instructional leadership, and school performance (*Performance Rating*). The principals in lower-performing schools in this sample utilised more direct instructional leadership and principals in higher-performing schools utilised more indirect instructional leadership, perhaps explaining this relationship between constructs.

Figure 14 Structural Model for School Performance (Performance Rating)



Culture

This model (Figure 14) suggests that the principal's indirect instructional leadership does not work through the Cultural Indirect dimensions (-2.09). Rather, it has a direct effect (2.78) on performance (*Performance Rating*) or could be working through the positively related Cultural Direct dimensions (1.32). This suggests that while the principals in these schools may not have been taking a direct instructional lead, the culture of the school as represented by the collective leadership team and staff members, was strongly focused on data based inquiry, professional development, and taking collective responsibility for all students (Items 13–18, 23–28, 31–38).

So while this structural model suggests high performance to be positively related to indirect principal instructional leadership, it is the direct cultural dimensions that are positively weighted indicating these schools have staff who are actively inquiry focused (Cultural Direct) and have a depth of managerial and teacher leadership already and are likely to be highly performing. Thus, perhaps principals in these schools do not need to take the direct instructional role as others already take that role. Principals add value by taking a strong role in managing the environment (Principal Indirect).

Improving Schools

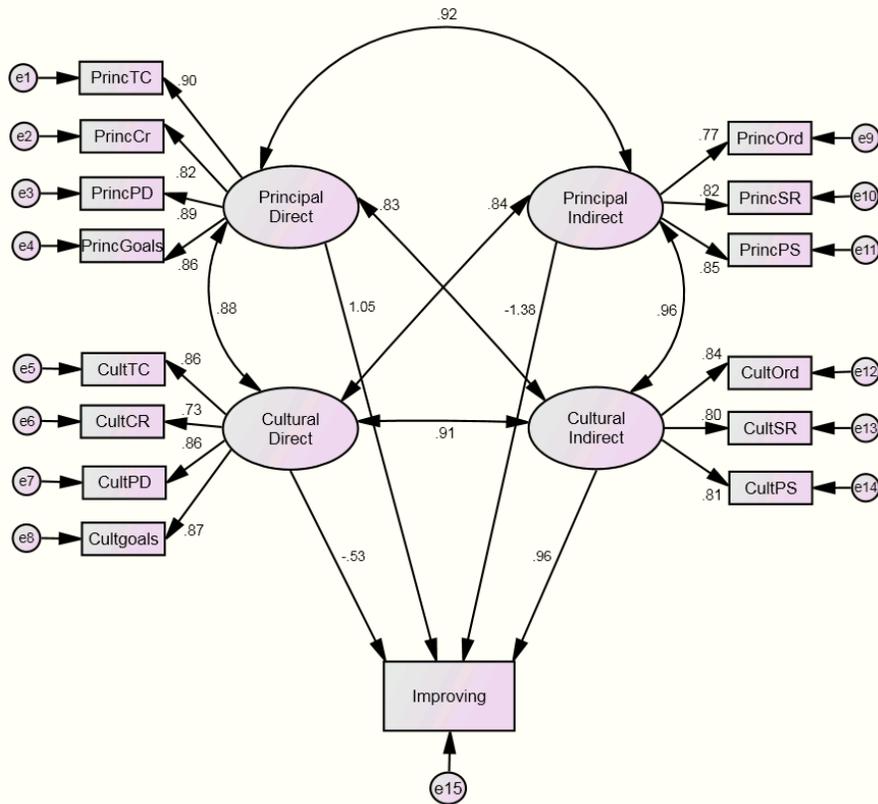
The assessment of the goodness of fit for the *Improving Schools* model (Figure 15) was also adequate to suggest a reasonable fit ($\chi^2 = 758.69$, $df = .81$, RMSEA .113, NFI .91). When a structural model specifying that the Principal Direct and Indirect influences on the *Improving School* status were mediated by the Cultural Direct and Indirect influences, direct instructional leadership by the principal had the positive relationship (1.05) and again, supports Hypothesis 5 that stated that *Improving Schools* were likely to have principals who were utilising direct instructional leadership to greater effect. Again, direct principal instructional leadership does not appear to work through direct cultural items necessarily as Cultural Direct dimensions were negative.

In this case, the indirect principal behaviours had a negative relationship with the outcome variable (-1.38), indicating that it was principals of *Other Schools* that were more likely to be utilising indirect instructional leadership to gain effects. The indirect cultural items on the other hand had a positive effect (.96), suggesting that the staff in *Improving Schools* already enjoyed an orderly environment, that

the schools were well resourced, and problems of staff were attended to (See Appendix C for items in the indirect dimensions). The principal was focused on direct instructional leadership (1.05), but the Cultural Indirect indicator of the schools was positive (.96) suggesting a stable and well managed environment. These data suggest that to improve, schools first had to be staffed and resourced well, and have an orderly environment which is consistent with my earlier findings that most *Improving Schools* were already mid- or higher-performing; they were over the early hurdles. This is consistent also with findings of Bryk, Sebring, Allensworth, Luppescu, and Easton (2010) who showed that a safe and orderly environment was one of the key elements required for schools to improve (along with school leadership, parent involvement, work orientation, and curriculum alignment). A similar observation was recently made by Jacobson (2011).

An interesting pattern that emerges from these two structural models is that where Cultural Direct dimensions are positive (in higher-performing schools), the Principal Indirect dimensions are positive, and where the Principal Direct dimensions are positive (in *Improving Schools*) the Cultural Indirect dimensions are positive. These models appear to indicate that both higher-performing and *Improving Schools* are effective because they tend to have complementary cultures and principal behaviours. Principals in these high performing schools did not have to use direct instructional leadership—it was embedded in the school culture, and principals in *Improving Schools* enjoyed cultures that were already better resourced and more orderly and were able to turn their attention to teaching and curriculum improvements.

Figure 15 Structural Model for *Improving Schools*



Hypothesis 7: Community factors (SES, school size, transience of students) will have a greater impact on school performance than principal leadership factors (experience as head of department, deputy, or principal, and service in the school) or principal instructional leadership.

This hypothesis was investigated in three separate steps. First, the teacher, principal, and community factors were regressed against outcome variables. Then, a structural model was built to establish which variables appeared to have the greatest effects and the direction of the effects. Finally, the significant factors were regressed in four steps against the school performance rating and *Improving School* outcome variables with principal and cultural dimensions being added in the third and fourth models.

Community effects were assessed first as these tend to be reported as having the strongest effects on performance. Principal background effects were assessed next as the regression of these factors (Table 37) suggested different significant effects for the two differing models (Performance Rating and Improving Schools). Then principals' instructional leadership was expected to have small but significant effects and then cultural effects were added to the model in the fourth step.

Regression of Teacher, Principal, and Community Variables

First, answers were sought for the questions raised in the literature review regarding the existence of any possible relationship between school performance or *Improving* status and teacher, principal, and community factors. When these factors were regressed against the schools' performance rating, a moderate level of relationship overall was indicated ($R^2 = .32$, $F = 28.809$, $df = 11$, $p < .001$). When the same factors were regressed against the *Improving School* status, a similar level of relationship existed ($R^2 = .36$, $F = 34.426$, $df = 11$, $p < .001$). The results are summarised in Table 37.

Table 37 Beta Weightings of Teacher, Community, and Principal Variables

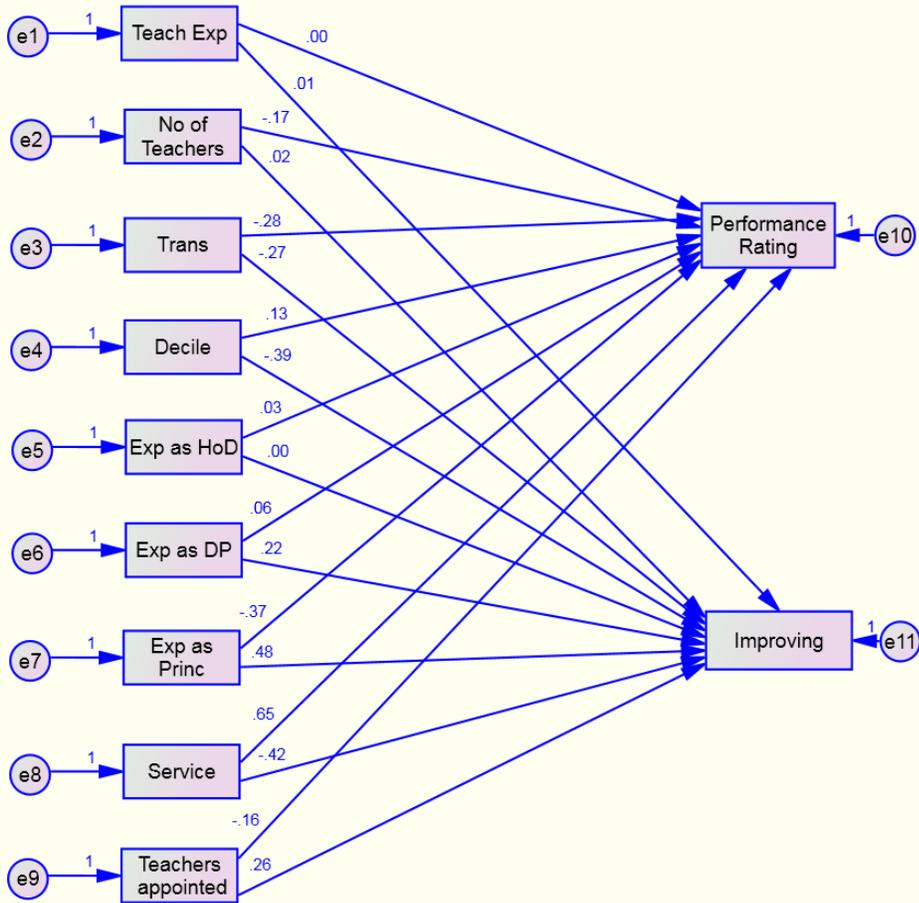
Independent variable	School Performance Rating	Improving Status
Principal's service in this school	1.14	-.52
Decile	.18	-.66
Principal's experience as DP	.12	.41
Principal's experience as HOD	.09	NS
Experience of teachers	NS	NS
School size	-.31	-.03
Number of teachers the principal has employed	-.32	.34
Transience	-.52	-.58
Principal's experience as principal	-.56	.85

No significant relationship was found between the number of experienced teachers on the staff and school performance or *Improving* status. School size was negatively related, indicating that smaller secondary schools perform better. Decile was positively related to school performance but negatively related to *Improving* status. This result was expected as *Improving Schools* in this sample have already been shown to be largely low and middle decile schools (see Chapter 2). Not surprisingly, student transience was negatively related to both outcome variables in that the higher the transience the more negative the impact on performance.

Personal characteristics of the principal (e.g., previous experience as deputy or principal etc.) were not uniformly related to school performance. Principals in higher-performing schools appeared to have longer tenure in their schools, while principals in *Improving Schools* tended to be newer to their schools but had employed more of their own teachers and were more experienced as a principal. These findings were supported when a structural model was created of these variables (see Figure 16). *Improving Schools* were more likely to have principals who had appointed more of their own teachers, had less service in the school, but had more past experience as a principal and deputy. Principals of higher-performing schools tended to have longer tenure in the school and less previous management experience.

Factors such as family educational history, prior learning attainment, SES, motivation of the student, and quality of teaching would be expected to have a greater impact than principal level variables (Alton-Lee, 2003; Hattie, 2009b). While many of those factors were beyond the scope of this research, the relative strength of school decile and student transience was able to be assessed so a step-wise regression was then used to ascertain the relative importance of the various school and principal background variables that were significant (as listed in Table 37) compared to the principal instructional leadership behaviours. The greatest source of variance to explain the school performance (*Performance Rating*) and *Improving* status outcomes was the principal leadership factors, not the community factors as expected.

Figure 16 Structural Model for Teacher, Principal, and Community Factors.



Step-wise Regression

As Table 38 shows, the length of time a principal has been in the school (Service, .99) explained most of the variance in *Performance Rating* along with school decile (.19), and the principal’s prior experience as a deputy (.15). Negative results indicated high performance was predicted by less transience of students (-.43), smaller schools (-.24) and less appointments of new teachers by the principal (-.26).

Table 38 Predictors of Higher Performance

Variable	Performance Rating			
	Model 1 <i>B</i>	Model 2 <i>B</i>	Model 3 <i>B</i>	Model 4 <i>B</i>
Decile	.028 ***	.201 **	.200 **	.199 **
Transience	-.351 ***	-.450 ***	-.466 ***	-.434 ***
No of Ts (size)	-.115 **	-.268 ***	-.273 ***	-.240 ***
Exp as HoD		.062 NS	.071 NS	.082 NS
Exp as DP		.097 *	.131 **	.147 **
Exp as Princ		-.599 ***	-.579 ***	-.552 ***
Principal's service in this school		1.04 ***	1.03 ***	.998 ***
Ts appointed		-.250 ***	-.258 ***	-.263 ***
Princ Ord			-.003 NS	-.030 NS
Princ Goals			-.120 *	.107 NS
Princ TC			-.058 NS	-.024 NS
Princ PD			-.155 *	-.071 NS
Princ SR			.123 *	-.80 NS
Princ PS			.067 NS	.024 NS
Princ CR			.044 NS	.049 NS
Cult Ord				.041 NS
Cult Goals				.069 NS
Cult TC				-.093 NS
Cult PD				-.181 **
Cult SR				.110 NS
Cult PS				.037 NS
Cult CR				.027

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 39 shows, when *Performance Rating* was the outcome variable, 13% of the variance (Adjusted R^2) was explained by community factors such as decile, but a further 19% was explained by the principal background factors while principal instructional leadership explained approximately 2% and culture only 1%.

When *Improving* status was the dependent variable (see Table 40), the most significant factors were previous experience as a principal (.79), experience as a deputy (.39), and service of the principal in the school (-.70) indicating these principals were relatively new to the schools. The principals tended to be in lower decile schools (-.62), where the principal had appointed more teachers (.44), and dealt with a transient population (-.47).

Table 39 Model Summary of Four Step Regression on School Performance (Performance Rating)

Step	R	R ²	Adjusted R ²	Change Statistics			
				R ² Change	F Change	df	Sig. F Change
1	.366	.134	.130	.134	30.745	3, 596	<.001
2	.570	.325	.316	.191	33.395	5, 591	<.001
3	.593	.351	.334	.026	3.392	7, 584	.001
4	.608	.369	.345	.018	2.349	7, 577	.023

Table 40 Predictors of Improving School Status

Variable	Model 1 B	Model 2 B	Model 3 B	Model 4 B
Decile	-.552 ***	-.638 ***	-.638 ***	-.620 ***
Transience	-.327 ***	-.476 ***	-.474 ***	-.458 ***
No of Ts (size)	.131 **	.027 NS	.015 NS	.014 NS
Exp as HoD		.027 NS	.039 NS	.057 NS
Exp as DP		.362 ***	.388 ***	.389 ***
Exp as Princ		.801 ***	.820 ***	.798 ***
Principal's service in this school		-.687**	-.699 ***	-.703 ***
Ts appointed		.426 ***	-.426 ***	.438 ***
Princ Ord			-.021 NS	-.014 NS
Princ Goals			.235 ***	.198 **
Princ TC			0.13 NS	-.024 NS
Princ PD			-.304 ***	-.242 **
Princ SR			.079 NS	.043 NS
Princ PS			.094 NS	.096 NS
Princ CR			.049 NS	.008 NS
Cult Ord				-.091 NS
Cult Goals				.153 *
Cult TC				.088 NS
Cult PD				-.175 **
Cult SR				.075 NS
Cult PS				-.022 NS
Cult CR				.080 NS

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

As Table 41 demonstrates, about 39% of the variance in *Improving Schools* can be explained by these four levels of factors: community, principal leadership factors, principal instructional leadership, and the cultural dimensions. Notably, only about 4% of the variance is explained by principal instructional behaviour compared to 20% that can mainly be attributed to principal leadership experience as both a

principal and deputy. Of the 4% attributed to principal instructional leadership, *Goals* is positively related and *Professional Development* is linked to the five lower-performing schools that appeared to be working hard on improvement with more positive scores for direct instructional leadership.

Table 41 Model Summary of Four Step Regression on Improving School Status

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Change Statistics			
				<i>R</i> ² Change	<i>F</i> Change	<i>df</i>	Sig. <i>F</i> Change
1	.366	.134	.130	.134	30.808	3, 596	<.001
2	.581	.338	.329	.203	36.275	5, 591	<.001
3	.624	.389	.373	.051	7.005	7, 584	<.001
4	.639	.409	.386	.020	2.787	7, 577	.007

While the amount explained by principal instructional leadership appears low at approximately 4% now that principal and community factors are controlled, Ogawa and Hart (1985) argued that “even small proportions of variance are important” (Ogawa & Hart, 1985, p. 65) given that step-wise regression assumes the greater influence of school over principal level effects and some effect from the principal level is likely to be reflected in the school level variables. Their research cited effects of between 2.6% to 8% as principal effects in secondary schools, and they stated that this was in line with research effects of CEOs on sales or profits.

The question to ask is how much difference can 4% make? Effect sizes reported earlier suggest behaviours can usually have an effect of between .2 and .4. This is not an insignificant effect and is consistent with most findings of principal instructional leadership having a small, but significant effect (Hallinger & Heck, 1998). The surprising result here is the 19% to 20% attributed to principal leadership factors.

Hypothesis 8: Teachers in English, mathematics, and science departments assess principal instructional leadership less favourably than other teachers.

Finally, Rowan, Raudenbush, and Kang’s research (1991) in the United States indicated that considerable variation in the views of teachers in differing departments within secondary school settings can occur. Rowan and colleagues (1991) found that English, mathematics, and science teachers held somewhat

harsher views of their principals' performance than teachers in other departments so a high degree of agreement was not necessarily expected. Thus, a multivariate analysis of variance was carried out on the principal dimensions by department but no significant differences were found between departmental responses (Wilk's lambda .876, $F = 1.266$, $df = 63.000$, $p < .078$).

Discussion

Limitations

Whilst the purpose of this research was achieved in that the relative effectiveness of some principal instructional leadership behaviours was identified, it is a small investigation into the instructional leadership of one group of 29 secondary school principals. The size of the sample is an obvious limitation making it unwise to generalise from these results. Nevertheless, the sample size is comparable to those of Gaziel (2007) and Blank (1987), each with 32 secondary schools and with Heck (1993), and Heck and Marcoulides (1996) with 26 secondary schools. So while the sample in this research is not large and results from it cannot be generalised, it provides another piece of information to add to a reasonably scant quantitative knowledge base about principal instructional leadership and school performance in secondary schools.

The analysis of results at both teacher and school level show that the results are consistent across the two levels of analysis and significant when analysed at the teacher level. Heck (1993) suggested that small numbers of schools make aggregation of the data to the school level problematic, and noted that consistent results were usually reported at the two levels, but reporting at the individual (teacher) level is acceptable. Certainly in this case, the school level analysis mirrored the individual level results, but because of sample size, results were not significant when analysed at the school level. Attempts at hierarchical linear modelling were unsuccessful (mostly due to the high inter-correlations between factors), but the need to revert to such complex multilevel modelling is not universally agreed (Cohen, et al., 2007). The results presented here, clearly show discernable patterns associated with schools that were improving and those that were higher-performing.

Some may argue that the school performance measure described in Chapter 2 is relatively broad (being a performance measure of higher-, mid-, or lower-performance). Again, it should be noted that this type of method is utilised in similar research (Heck, 1993; Heck & Marcoulides, 1996) and that the measure does take into account the value added by a school through two of the three school performance indicators. In addition, it is not possible to obtain student level data in New Zealand so this schools-of-similar-type measure that focuses on the band of performance of the school is probably the best that can be achieved under the circumstances. Any claim that schools can be ranked exactly is debateable given the range of factors to be taken into account, but the claim of being able to group schools comparatively is a far more defensible claim and is potentially more productive. The inclusion of a measure of improvement has added greatly to the interpretation of results. Having this alternative measure of performance has highlighted that different behaviours are effective in different contexts, and it is the behaviour that gains improvement that perhaps needs to be given more attention in future research. As Elmore (2004) stated, “a large number of ‘successful’ schools are not improving schools” (p. 255).

Another limitation is the degree of redundancy between dimensions as reported in Chapter 4. In addition, some dimensions have few items. The results themselves dispel some of these concerns, because clear patterns of results were identifiable with the differing dimensions, and the dimensions themselves were quite tightly defined with little overlap in behaviours in order to test a theory. While all dimensions were clearly linked with goal oriented behaviour, they nonetheless help to establish that principals can be effective using indirect instructional leadership as well as direct.

Principal Effects

A major surprise that arose from this research was the significance of principal school leadership experience as indicated by the regression models. In *Improving Schools* in particular, the experience of the principal as both a principal and deputy, was a strong predictor of a school’s ability to improve. The principal also appeared to have come in as a ‘new broom’ and had not been in the school for long periods of time, which by way of contrast was the best predictor of higher-performing schools (i.e., the principal’s service in that school). Also, the principal’s effects in the higher-performing school appeared to be half (2%) of those in *Improving Schools* (4%), and whilst still small, this latter amount of variance is likely to have an impact on performance (Ogawa & Hart, 1985). Wahlstrom and Louis (2008) found R^2 of

.042 of shared leadership in secondary schools when regressed on teacher practices, indicating 4% of variance was explained in their study also, so the results reported here are consistent with others.

My research supports previous studies that have indicated that principal instructional leadership can make a small but significant difference to school performance, so long as the behaviours of the principal are closely aligned to academic goals. Like many other studies in secondary schools, direct instructional leadership effects were small despite making the items 'secondary-friendly', but some indirect instructional leadership behaviours had moderate effects illustrating the benefits of this type of behaviour. These findings support my original contention in Chapter 1 that the principal's role is largely facilitative of the instructional leadership of others and that these behaviours can be effective.

Various explanations can be considered to explain the differences between principal effects in higher-performing schools and *Improving Schools*. One is that *Improving Schools* are going through change, and that a subset of instructional leadership behaviours is the instrument for improvement. As has been shown, the lead teaching and curriculum role is taken by the deputy principal (see Figure 6) or the heads of departments (see Chapter 3: Literature Review) and in a higher-performing school one would expect the overall leadership team to be working effectively together to maintain high levels of achievement. It appears, however, that direct instructional leadership by the principal is associated with improvement. This suggests that schools that are lower-performing or schools that are not serving all students well require strong and direct instructional leadership from the principal to gain traction. Principals in higher-performing schools appeared to have stronger effects from indirect dimensions, but the culture of those schools already appeared to be directly focused on instructional quality.

Notably, though, the principals in higher-performing schools still had the same level of effects from direct dimensions as those in *Improving Schools*. Having said that, it is acknowledged that only three items measure *Principal Collective Responsibility* (Items 41, 42, 43) and four measure *Teaching and Curriculum* (Items 5, 6, 45, 46) behaviours by the principal but these items, along with the goal-oriented dimension, point to very specific and direct instructional leadership by the principal as predictors of both improvement and high performance in this sample of schools (see Appendix C for items). Of interest also is that the *Collective Responsibility* items were included under the *Professional Development* dimension

by Robinson and colleagues (2008), so the significance of this specific behaviour was not known from that research. The high correlation with achievement may in part reflect the sense of collective responsibility driven by the principal. It is perhaps the dimension that most represents ethical leadership.

Another possible explanation for the differing patterns associated with higher-performing and *Improving Schools* is that these differences are in part a result of the socio-economic differences between schools. Principals maintaining relatively high-performing schools are likely to be working in middle and high decile communities (see Chapter 2), and may be dealing with a different clientele to many principals in the *Improving Schools* group. The latter schools, as has been seen by the results of Study 1, tended to be middle or lower decile schools that were already performing reasonably well (mid-performing and higher-performing). Thus, these results indicate that principals may need to take a direct instructional leadership role to gain a lift in performance under challenging circumstances. In lower SES areas, a principal is more likely to have to take a direct instructional role to be effective because it is likely to be more difficult to employ high quality staff, and student outcomes may reflect both low community and teacher expectations (Blank, 1987). Thus, an explanation for the differing results of *Improving Schools* and higher-performing schools may be the differing types of challenges in the communities of these schools, and principals' responses to these challenges. As has been seen, 38% of the schools (11/29) in this study were from a lower decile community and *Improving Schools* tended to be from low and middle decile communities, but were already performing reasonably well (mid- and higher-performing). Structural models also suggested that *Improving Schools* had already gained a stable environment. So, in summary, the principal instructional leadership dimensions required to be effective will vary according to the challenges of the setting and it is quite a different thing to take over a school that is acknowledged as being higher-performing, and dealing with the realities of taking over a school that is besieged with challenges arising from relative socio-economic deprivation (Bryk, et al., 2010; Elmore, 2004).

The strength of the *Goals* dimension was no surprise. As this dimension was highly correlated with all other principal dimensions, it appeared that setting and communicating goals was a core part of a higher order factor, which is frequently referred to as *academic press*. All of the items in my dimensions had a strong academic goal focus inherent in them. So, to resource strategically, for example, is to resource

with a focus on improving academic outcomes, and to resolve problems effectively, is to ensure that teachers are well-supported to deliver on academic outcomes. For example, Brewer's (1993) study showed how high goals by a principal work in combination with other behaviours such as hiring quality teachers to gain effect. Thus, purposeful goal setting and high expectations underpin all other effective leadership behaviours in secondary schools (Brewer, 1993; Dinham, 2005; Gaziel, 2007; Hallinger & Heck, 1998).

This study showed that effective principals work largely through goals, regardless of whether the results from all principals or principals in higher-performing schools or *Improving Schools* were considered. The items in this dimension suggest that effective principals have a key role in developing professional learning communities through data-driven goal setting and by gaining teachers buy-in to goals as challenging but achievable. The role of effective principals in already higher-performing schools and those that require improvement appear to be different, but the research presented here suggests that goals are central regardless of the current level of performance. When compared to other research cited in the literature review, the moderate strength of the *Principal-Goals* dimension (0.36 for higher-lower comparison and 0.31 for higher-mid comparison) was mid-way between the finding of 0.42 reported by Robinson and colleagues (2008), and an average of 0.24 by Marzano, Walters, and McNulty (2005).

It was *Principal-Problem-Solving* that had the highest effect sizes in higher-performing schools, despite this reflecting just two items (Items 49, 50). This result points to the importance of principals taking teacher issues seriously and working hard to resolve issues that affect them. With an effect size of 0.41 for higher- and mid-performing schools and 0.44 for higher- and lower-performing schools, this can be considered a moderate effect and thus an important behaviour for principals in secondary schools. Problem-solving demonstrates the principal's commitment to supporting staff to do the job, and in return, principals are more likely to accrue support from staff due to their competence in managing the school.

The strength of the *Principal-Strategic Resourcing* dimension (Items 9, 10) indicates that principals in higher-performing schools effectively utilise resources (both material and human) to improve teaching outcomes. This is consistent with some recent case study research (Chenoweth, 2007; Louis & Miles, 1990), with Brewer's (1993) quantitative research in US secondary schools that showed that principals

with high goals influenced outcomes by appointing teachers who shared those ideals, and with the findings of Hallinger and Murphy (1987). The *Principal-Strategic Resourcing* effect size for school performance was 0.36 when higher- and mid-performing schools were compared, and 0.44 when higher- and lower-performing schools were compared; a result comparable to Robinson and colleague's (2008) 0.31.

Effects for *Principal-Professional Development* (Items 7, 8, 47, 48) were small. In the literature review it was argued that the secondary school principal would not have a strong role in the *Professional Development* dimension due to the role of deputies and heads of departments so this result, while surprising in the light of findings by Robinson and colleagues (2008) with an effect size of 0.84, may have a simple explanation. Their findings were based on mainly primary school samples and measured leaders in general, not just principals. As has been shown, deputies and heads of departments usually carry out the management and coordination of professional development in secondary schools, which may explain the weakness of this dimension in this study. In addition, as already mentioned, Robinson and colleagues included *Collective Responsibility* items in this dimension, whereas I have drawn them out into a dimension of their own. The nature of the items may also warrant a re-examination; more emphasis should perhaps have been put on the principal designing and coordinating the professional development.

The *Teaching and Curriculum* dimension had small but significant effects for both school performance (0.21) and improvement (0.19) outcomes. This differed from the larger effect (0.42) reported by Robinson and colleagues (2008), but was the result expected, given the conclusions of the literature review. The main influence on curriculum delivery is via heads of departments. In addition, further items should ideally have been included that related to the principal emphasising test results, having input into the design of the curriculum, and influencing instructional methods, but regrettably, the possible importance of these items as indicators was not discovered in secondary-specific studies until after the design and application of the questionnaire was completed. The results still show, however, that principal effects in this dimension are important and significant and they were consistent regardless of the outcome variable.

The *Collective Responsibility* dimension (Items 41, 42, 43) was associated with both *Improving* status and high levels of school performance although again effects were small but significant, suggesting that the following behaviours are critical for principals in gaining improvement: *Challenging the teachers who are not serving students well, to improve; Encouraging teachers to take responsibility not only for their own actions and students, but also for those of others; and Challenging teachers to not dismiss inability to reach school goals as an inevitable consequence of home environment*. It was notable however, that this dimension was least utilised by all principals (along with *Teaching and Curriculum*), and points to a need to put more emphasis on secondary schools taking responsibility for *all* students. In the self-managing environment there is little kudos for schools that work hard to retain and challenge the lower-achieving students or students with special needs. Rather, schools may be motivated to avoid enrolling these students as secondary schools tend to win their reputations and increase their rolls through their academic and sporting records. A principal's role in leading this type of attitudinal behaviour, which can be considered *ethical leadership*, seems to be an essential element in gaining improvement and is fundamental to the concept of instructional leadership, as argued in Chapter 1.

Finally, the effect size of the *Principal-Orderly Environment* (Items 1, 2) dimension was 0.28 (for higher- and mid-performing schools); almost identical to Robinson and colleague's findings of 0.27, suggesting again that while effects are small, principals that focus on creating an orderly environment can make a significant difference. The items here referred to principals who protect their staff from undue pressure, and who share leadership roles with staff. Protecting staff from undue pressure was a key discriminator between higher- and lower-performing secondary schools in Heck's (1992) study and findings here support that item as a consistently strong discriminator between groups of schools. For example, one may set high goals, but if the school playground is chaotic, goals are unlikely to impact positively. As both Elmore (2004) and Firestone and Rosenblum (1988) have stated, people are unlikely to follow someone who can't "make the trains run on time". Similarly, the second item referred to principals who shared leadership with teaching staff, acknowledging that the required expertise to lead can come from any staff member. Both items suggest a less bureaucratic, shared approach to leadership of the learning environment is a mark of higher-performing schools. This is consistent with the findings of Hofman and colleagues (2001) and will be discussed further in the final chapter.

Cultural Effects

An orderly environment appeared to be a relatively important contributor to high performance in secondary schools. The *Cultural-Orderly Environment* dimension (Items 11, 12, 21, 22) had the highest effect sizes for school performance (0.53 and 0.55) indicating as other research often has, that higher-performing schools have safe learning environments where instructional time is protected, discipline is fair, and the environment is orderly and caring.

That the *Orderly Environment* cultural dimension did not feature in *Improving Schools* results was a surprise, as this aspect of instructional leadership in secondary schools is important because school discipline affects the attractiveness of a school to the parents of future students. In New Zealand, if the roll drops, so does the funding. In their review of literature regarding schooling improvement in low SES areas, Mujis, Harris, Chapman, Stoll, and Russ (2004) found that many improving schools had to get an orderly environment first before they could improve. While these researchers did not consider that this was necessarily a first step, results in this case could indicate that for these *Improving Schools* orderliness was a challenge they had already largely overcome. The structural models suggested that direct instructional leadership in *Improving Schools* may be partnered by a relatively orderly school where the principal has already made some changes including numerous new appointments of staff.

The strength of the effect size for *Cultural-Problem Solving* dimensions for higher-performing schools (0.41) compared to that of *Improving Schools* (0.19) was an interesting result also. At first, it seemed reasonable to expect *Improving Schools* to have the strength in problem solving. Higher-performing schools, however, are more likely to be high or middle decile, and, as suggested by Hallinger and Murphy (1987), the role of problem solver with a demanding higher-SES community may be a role that principals and senior managers are forced to take to ensure the continued popularity of their school.

One major quandary from these results was the pattern of direction indicated by the structural models. Given that the items for principals and the overall school staff (cultural items) were strongly mirrored, it was at first thought surprising that no positive association between the two was shown. In fact, a complementary association was shown. When principal dimensions were direct and positive, cultural dimensions were indirect and positive; and when principal dimensions were indirect and positive,

cultural dimensions were direct and positive. On reflection, this scenario makes sense. If the school staff is already well-focused on achievement, the principal's role may well be more as facilitator and encourager (indirect). But where a school requires improvement, the principal's role is direct, but needs to be built off a strong relationship base that is likely to be consistent with positive indirect cultural indicators (orderliness, resourcing, problem solving) first. Teachers and students are more likely to follow leadership where it has already shown itself to be built on competence and personal regard for them as people. Then, if quality of instruction needs enhancing, teachers are more likely to follow the principal's lead. It is only where teacher instructional leadership is not strong that teachers in a secondary environment would need to turn to the principal for direct instructional leadership. As Wahlstrom and Louis stated (2008), "Perhaps only where professional community is weak do teachers look to the principal for direct instructional support" (p. 243). A process of building trust through good decision-making and short-term wins in the environment that supports learning is required before improvement can take root in the classroom (Bryk, et al., 2010; Elmore, 2004).

Conclusion

This research supports the main thrust of the literature review—that secondary school principals do not often take a direct instructional leadership role and that principals can use indirect instructional leadership to good effect. It was not clear, however, if that would be true of principals in the most effective schools. In *Improving Schools*, use of *Goals*, *Teaching and Curriculum*, and *Collective Responsibility* were effective instructional leadership behaviours for principals that differentiated them from other principals. High performance on the other hand, tended to be characterised by these direct dimensions plus indirect instructional leadership by principals.

Had this study only focused on school performance and compared principals in higher-performing schools to those in mid- and lower-performing schools, the conclusion reached could have been that higher-performance in secondary schools is associated mainly with indirect instructional leadership on the part of the principal. When *Improving Schools* were compared to *Others*, the importance of direct instructional leadership by the principal was highlighted along with a school culture that was focused on *Teaching and Curriculum*. These findings tend to indicate that the nature of effective principal instructional leadership is dependent on the developmental stage of the school. Schools, as with other

types of organisations, evolve and different leadership behaviour is likely to be required to respond to different situations appropriately (Hallinger & Murphy, 1987). What this research has pointed out is that there is perhaps more than one way to be effective as a principal and that the type of instructional leadership required may differ depending on the stage of development of the school.

Chapter 6: Discussion and Conclusions

In this thesis, I set out to establish if links could be made between levels of school performance and the instructional leadership of principals in secondary schools. I argued that secondary school principals probably exerted most of their influence indirectly through decisions that impacted on the organisation and culture of the school, and that so long as the decisions that a principal made were focused on improving teaching and learning, the principal was likely to impact on the school's performance. Instructional leadership that impacted directly on teaching practice, I argued, was probably mostly carried out by heads of departments. This chapter revisits and discusses the key findings of this research. It outlines the methodology used, makes links to contextual matters outlined in Chapter 1, and discusses the key themes that emerged in this research. The implications for strengthening secondary school principal leadership in a New Zealand context are then discussed.

In order to answer the main research questions about the effectiveness of principal instructional leadership, I first had to assess the relative performance levels of schools. Study 1 (Chapter 2) described how publicly available student achievement data (National Certificates of Educational Achievement-NCEA) were used to categorise schools by performance levels. Three indicators of raw school performance data were aggregated by the use of rules to categorise schools as higher-, mid-, or lower-performing. This method was also used to identify schools that were improving.

A review of relevant literature revealed that secondary schools were broadly stable in their relative performance levels compared to other schools over time. Improvement in performance levels was, therefore, deemed to be a critical indicator of effective instructional leadership, and as such, two further indicators were developed to assess improvement. Thirty-five per cent of the whole sample of 102 schools in Study 1 were categorised as *Improving* over the four year period of 2004–2007.

Study 2 (Chapter 5) tried to establish whether direct and indirect instructional leadership behaviours, and school culture, were associated with high performance or improvement. I worked on the assumption that principal leadership was moderated by, or worked through, the school culture (the attitudes, values, and beliefs of teachers). In order to test this theory in the second study, data on the principal, the community (SES), instructional leadership of principals, and the culture of the schools were

gathered via a 60-item questionnaire for teachers (Appendix B) and a simple one page questionnaire for principals (Appendix F).

Limitations of this Research

A major limitation with Study 2 is that the results cannot be generalised to the total number of 78 secondary schools in the Study 1 population because the sample was neither random nor large with 29 principals and 651 teachers. This sample was higher-performing, had more improving schools, and was higher decile (SES) than the wider population of Study 1 schools. Nevertheless, this research allows further insight into some specific aspects of instructional leadership that can be considered with other similar research from a variety of countries.

Other limitations have been mentioned in the relevant sections of this research. The categorical system of rating performance in Study 1, for example, while similar to that used in comparable research such as that of Heck (1992, 1993), could be criticised by some as not being sensitive enough to differences in school results. I argued that the measurement method described in Chapter 2 was robust in that it took into account performance over four years and across three levels of NCEA and included two value-added indicators as well as the gross performance levels of schools. In addition, the method established which schools had the most consistent improvement over four years, and as a result allowed principals in differing contexts to be compared.

Similarly, the validity of Study 2 was largely dependent on the validity of the constructs for principal instructional leadership and school culture (Cohen, et al., 2007). Confirmatory factor analysis was carried out and a high level of redundancy was found particularly in the constructs of the principal dimensions. The dimensions, nonetheless, provided significant effects in subsequent analyses, so while undoubtedly able to be improved, served their purpose of allowing distinct behaviours to be assessed for effectiveness.

Given the focus on principal instructional leadership, it would perhaps have been advantageous to have developed a greater bank of principal dimension items. For example, more emphasis could have been

placed on the role of principals in coordinating across departments, or of decision-making about the structure of the curriculum or instructional methods. Whilst other research has used a similar number of items (e.g., Heck, 1993), future iterations of this research could benefit from more items per principal dimension to more thoroughly investigate the role of the secondary school principal in school performance. Similarly, I did not touch on factors relating to the principal's engagement with the school's community, mainly because these items were largely not evident in the original questionnaires that I used to develop my survey. Again, this factor would be important to capture in a future iteration of the survey.

Measuring School Performance

The first aim of this research was to develop a system to assess the relative performance of secondary schools. That goal was achieved. The consistency of results and trends over four four-year periods (not reported here) suggest that this is a system that could be used to identify and support schools with the highest needs—those that are lower-performing and not improving over time. This model of making comparative judgements about school effectiveness offers a degree of certainty about the relative levels of performance of schools using NCEA. It was a model that I was able to draw upon in my role as a manager for the Ministry of Education to make some robust decisions about where support was most needed. The method also highlighted schools that were not as high-performing as the general public may suspect, in that there is a tendency with the public to equate high decile with high performance.

There is no reason why the type of methodology that was developed in Study 1 could not be applied to all schools—primary and secondary, to proactively identify those that demonstrably need extra resources to meet their current challenges. New Zealand primary schools have just had National Standards introduced. The model is unique to New Zealand in that it does not rely on single tests, but relies on overall teacher judgement using a range of evidence against nationally set standards. But, New Zealand has not yet taken a systemic approach to embedding this assessment system, and as with NCEA when it was first introduced, has not yet installed a system of on-going moderation and audit on the judgements made so that this data can be reliably used. If the data could be relied on and if it was reported in a standardised fashion, there is no reason why a system of indicators could not be used at primary school level to compare 'apples with apples', and assess which schools most need support.

A method of identifying schools that require support needs to be used, but it should be a transparent process developed with schools. Hattie (2009a) suggested that if we wish to improve outcomes for those who are clearly missing out, we need to focus on “‘adequacy’ of outcomes rather than, or as well as, equity of funding by socioeconomic resources...to reduce these gaps” (Hattie, 2009a, p. 123) intimating that we do need a clear picture of what an adequate standard or rate of progress is. The methodology developed in this research focused on adequacy with both the benchmark indicator and with the two value-added indicators that compare schools of similar type. It also identified schools that were most consistently improving and improving for Māori students in particular as part of that system.

Using this system of measuring school performance on 102 secondary schools, indicated that schools that were improving were more often schools that were already higher- or mid-performing, and they were usually in low or middle SES communities. These results indicated that those schools with most room to improve are not necessarily doing so, or that their efforts have yet to be converted into measureable improvement. School performance needs to be assessed with hard data on the achievement of all students in the school, and any system needs to take into account the differing challenges facing schools in different communities. Having done that, a systemic response is needed to support improvement to a level of performance that is recognised as at least adequate. Currently, the risk is that lower decile schools will be assessed as not performing well. Decile is not an indicator of effectiveness (Hattie, 2009a). In this study, the majority of schools in low SES areas were categorised as mid-performing as were the majority of schools in middle SES areas. A fair system of identifying schools’ comparative levels of performance is required. Only then can support be provided to those that need it most. The method used here offers that opportunity.

Importance of Principal Leadership Experience

The second aim of this research was to investigate principal instructional leadership in less and more effective schools, which in this case were defined as lower-performing and mid-performing compared to higher-performing schools, or schools that were improving compared to the others. It was expected that principals would have a small indirect effect on school performance, but that in all likelihood, the socio-economic status of a school and other community factors such as transience of students would be the

strongest predictors of school effectiveness. This was not the case. The community and school level factors did not appear to be as strong an influence as principal leadership factors. Four percent of the variance was explained by principal instructional leadership in *Improving Schools* and principal instructional leadership explained 2% of the variance in higher-performing schools. Whilst apparently small, this level of variance is consistent with other research (Ogawa & Hart, 1985).

Principal leadership variables, however, accounted for 19% of the variance in the results of higher-performing schools and 20% of *Improving Schools*. So, previous experience as a deputy and as a principal was a strong predictor of improvement, whilst a longer tenure by the principal in the school was a predictor of high performance. Other research has suggested that socio-economic factors are not always as strong a determinant of performance as other contextual features such as school size, the experience of teachers, or the type of school (Heck, 1993), but this principal background effect was, nonetheless, a surprising result. These results may be sample specific. If these findings were shown to be true of the national secondary school population (which cannot be claimed from this research), the information about principal characteristics would have at least three implications.

First, if schools that are underperforming are to improve, experienced principals who have proven to be effective should be appointed to lead these schools that most require support. In New Zealand, principals are selected by each individual school's board of trustees (parent or community representatives). They do not have to have any prerequisite qualifications or experiences. Further, Wylie (2009) pointed out that "A sizable minority of boards making appointments are disappointed with the quality of their short-listed applicants, and a sizeable minority have to re-advertise their vacancies" (p. 139). Wylie also pointed out that our most needy schools are often led by first time principals and are frequently in low decile and rural communities, with a high proportion of Māori students. So where we most need expert secondary school principals, we are likely to get novice principals, who are frequently the applicants for principalship in small, lower-performing secondary schools.

My findings suggest that we may need to attract more experienced principals to work in lower-performing schools. Even within our current competitive model of education in New Zealand, an incentive could be used to attract more experienced principals to take on these challenges with financial

incentives (through higher levels of remuneration in the principals' collective agreement, for instance). Other incentives could be more altruistic. Experienced principals may be keen to take on new challenges such as the opportunity to 'turn-around' a school with challenges. Rather than being appointed by a school board, it may be that schools once identified as having high risk factors, should have such principals appointed by the Ministry of Education. Current legislation does not allow this and the Ministry can only intervene by replacing board members. In my ten years of experience in the Ministry, I found risk to the performance of the school to be usually associated with principal competency as opposed to board competency. Experience of a principal does not necessarily equal expertise, but where there is evidence of both, it would be wise to use that capacity to provide support both to individual schools experiencing high challenges, and across schools more strategically.

Second, if we want principals in schools to be motivated to take responsibility for all students in their communities, to be focused on national goals, and to become more *system-centred* as well as *school-centred*, as a country we need to both demand and nurture this with a systemic response. A requirement to meet some pre-appointment standards for principals could ensure some level of expertise, training, or qualification prior to appointment as a principal. So I am suggesting, as in other countries, that we should have requirements that aspiring principals must meet before they can be considered as an applicant for a principal's role. Principals do not necessarily accept that it is their job to cater for *all* students—frequently someone else is supposed to take on the more challenging students. While much of the resistance may centre around the degree of support schools may receive for more challenging students, even with a lot of support principals are frequently very reluctant to be inclusive of all. This attitudinal requirement of instructional leadership needs to be explicit prior to a person being eligible to apply for a principal's position. Pre-principalship training should include an assessment of a person's likely fit to such a position, as well as being an opportunity to prepare for the role.

Third, the results relating to principal experience offered some support to the conceptual model of principal leadership that was put forward in the literature review in Chapter 2—that so-called *expert power*, (whether it be expertise in teaching, curriculum design, or management techniques) and *inter-personal power* may be required for a principal to make the right decisions at the right times, in varying situations, and facing differing challenges. Experience may be a great aid in developing the required levels of judgement in how to act to gain organisational improvement. Whilst acknowledging that

experienced principals do not necessarily equal expert principals, it is reasonable to assume some overlap between these two groups.

Perhaps a better way of illustrating how the principal influences performance is by way of a variation to the model proposed in Chapter 2 (see Figure 2). In the second iteration of the model (Figure 17), the context is central to everything, and instructional leadership is conceptualised as decisions about goals, reactions to problems, and efforts to resource, organise, and manage the learning environment for improvement. These impact on both school performance and school culture, and, in turn affect the principal's ability to continue to influence teachers (their power base). Both educational and interpersonal expertise is required to make the right decisions.

This conceptual model is very much akin to that proposed by Bryk, Sebring, Allensworth, Luppescu, and Easton (2010) who conceptualised leadership as the “driver of change” in a school, but concluded that three distinct elements were involved in principal leadership of improvement. Their first was a managerial dimension.

This represents the most basic aspect of school leadership. Its effects are most manifest in its absence—for example, a poorly run office, supply shortages, nothing starting or ending on time, poor communication with parents and staff, and little attention to administrative support for implementing new programs” (Bryk, et al., 2010, p. 61).

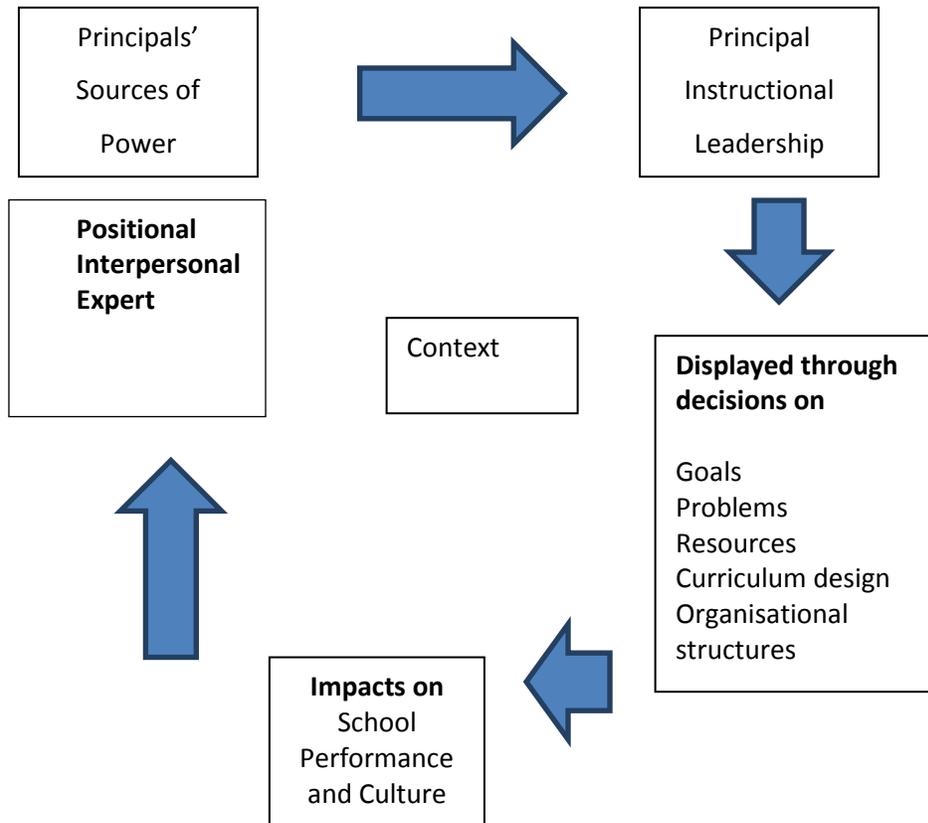
The second element was what these authors termed “the instructional dimension”, but which I called Expert Power implying expertise in both pedagogy and management on the basis of which sound decisions could be made. The third they termed an “inclusive-facilitative dimension”, which I have referred to as Interpersonal Power—the ability to inspire and motivate others to perform.

Direct and Indirect Instructional Leadership

Overall, the indirect instructional leadership behaviours of principals (of which problem solving appeared the most significant) were not only found to be most commonly used by all principals, but also

to be most effective in maintaining high levels of performance. The results of my research suggest that in higher-performing schools, principals gain greatest effect by being not only good goal setters, but also strong problem solvers, and strategic users of resource (e.g., who hire quality staff and resource departments strategically), with the latter two dimensions being indirect instructional leadership. Effect sizes for instructional leadership of principals when the higher- and mid-performing groups were compared were: *Problem Solving* 0.41, *Strategic Resourcing* 0.36, *Goals* .0.31, *Orderly Environment* 0.28, *Collective Responsibility* 0.24, *Teaching and Curriculum* 0.21, and *Professional Development* 0.17.

Figure 17 The Principal’s Power to Influence School Performance



Principals in *Improving Schools* used direct instructional leadership to gain effects, but the structural models in Chapter 5 suggested that these principals impacted on performance both directly and via a

culture that was already quite stable and procedurally strong (Cultural Indirect dimensions). As Elmore (2007) stated:

The early stages of improvement at all levels require a high proportion of leadership competence and focus on the technical side. People in schools will simply not be persuaded that proposals to improve their practice are credible if the people running the organizations in which they work cannot make the trains run on time (Elmore, 2007, p. 6).

It appeared from the structural models in Study 2 that the principals of schools that were categorised as *Improving*, already had ‘the trains running on time’. Now these principals were focused on gaining a sense of collective responsibility for all students, and were actively managing the teaching and curriculum delivery at a whole school level. They used direct principal instructional leadership to gain that effect.

But recall that most schools identified here as *Improving* had already reached at least a mid-performing categorisation. The obvious unanswered question is: “What are the prerequisites for improvement?”. I have suggested that an experienced principal may be one. Strong goal orientation appears to be another, as this is the most consistent dimension related to effective schools, both those that are higher-performing and those that are improving. A sense of collective responsibility may be a third feature of schools that are able to improve—teachers have to believe that students can succeed and that disadvantages can be overcome. A fourth factor may be good staff appointments. These can be considered the artefacts of good leadership, and are probably essential prior to gaining improvement in school performance results.

These findings point to the complexity of the principal leadership role. The success of the principal is not only reliant on instructional leadership, but also on their ability to work successfully in the conditions they find themselves in. When in a higher-performing environment, a principal may find a depth of instructional leadership in both the management team and wider teaching force, and must adapt to provide greatest effects by indirect instructional leadership. But when principals are in schools that clearly have a lot of room to improve, that same depth of teacher leadership will probably not be found

(or the school would be performing better). In that situation the principal must take a direct instructional leadership role, but it appears, only once they have built up a safe and stable environment. Improving schools, as was seen in this research, already had achieved that stability. These results are aligned to those of Hofman and colleagues (2001) who concluded that:

Cohesive and coordinated schools with clear educational concepts and ideas shared by teachers achieve better student outcomes on the whole than schools where this is not the case. Cohesion, coordination and collaboration within departments and schools are considered crucial to the development of an effective school. In order to create a cohesive educational school policy and a consistent social context of learning, appropriate conditions must be developed (p. 118).

Developing the “appropriate conditions”, which can be identified as supporting the development of professional learning communities, is the complex and difficult role of the principal. The structural models of principal instructional leadership and school cultures suggested complementary patterns of behaviour that resulted in tightly linked school teams. When the culture of the school was already strong in direct instructional leadership, the principal could affect school performance with indirect instructional leadership or by managing the environment—particularly with effective problem solving and strategic resourcing. When the culture of the school was strong in these indirect dimensions, the principal could effectively take the lead in matters concerning teaching and the curriculum. In other words, the effective principal complements the instructional leadership of the leadership team and teachers.

The notions of *team work* and *shared leadership* have not been highlighted in the language of this thesis, as the nature of principal instructional leadership and its relationship to the culture of the school was the focus. Nevertheless, these concepts have been inherent throughout the literature review and results sections. The complementary nature of the cultural dimensions and principal dimensions lends quantitative support to the argument that principal instructional leadership and the instructional leadership of the wider leadership team and teachers, is inextricably linked. They must be in harmony with one another.

The False Leadership-Management Dichotomy

Often the concept of *management* is eschewed in favour of *leadership* with managerial behaviours being dismissed as relatively unimportant. The results of Study 2 suggest that we should not dismiss managerial behaviours that support the learning environment as being less important than direct instructional leadership. Strong organisation and procedures underpin effective secondary learning environments (Elmore, 2007; Firestone & Rosenblum, 1988), and principals have the positional power to ensure these occur. Managed poorly, structures and routines impede teacher practice, such as when meetings are time-consuming and unproductive, or initiatives are not sustained through lack of support. But managed well, structures and routines support teacher practice, such as when students attend school every day and when learning time is maximised.

In essence, I have argued that indirect instructional leadership is the bedrock of leadership in secondary schools. It is not just about 'managing' as opposed to 'leading'. Instructional leadership by definition is strongly focused on the quality of instruction, but it attends to the underlying features of the schools' organisational effectiveness (routines, good appointments, solving problems) as well as the quality of teaching. The importance of these underlying features should not be minimised as mere 'management' when the focus is firmly on improving learning. Without efficient routines and procedures, or good appointments, a principal is unlikely to be able to concentrate on the direct instructional leadership that this research has indicated is required for both improvement and high performance.

The results of this research have strongly indicated that direct instructional leadership by the principal is required to drive improvement, but to do this, principals must ensure the environment is stable and well managed for instructional purposes. Improvement cannot occur in chaotic conditions. It is time to move past the management-leadership dichotomy and accept that the former is a necessary ingredient of the latter.

Culture as a Moderator of Principal Instructional Leadership

The structural models indicated that in higher-performing schools, principal indirect instructional leadership had both a direct effect on performance and an indirect effect via the Direct Cultural dimensions. This finding suggests that in higher-performing schools the principal worked through the

direct instructional leadership of other senior managers and staff. Conversely, in *Improving Schools* principals' direct instructional leadership had both a direct effect on performance and an indirect effect via the Indirect Cultural dimensions. This suggests that these principals impacted on student outcomes by their own direct instructional leadership and through the stable environment that was represented by the cultural dimensions.

The term 'culture' is perhaps an unhelpful one. While many researchers use the term *culture*, they frequently describe school systems and processes. An example of this can be found in a study by Sammons, Thomas, and Mortimore, (1997) who concluded that "...most of the school and department's influence is thus likely to be indirect, operating through the culture or ethos" (p. 179) and that "culture provides an important key to the understanding of secondary schools academic effectiveness" (p. 218). Yet these researchers also revealed that the three critical aspects of that culture were an orderly environment, an academic emphasis, and a student-focused approach—all of which probably points more to the effectiveness of systems and processes within a school along with effective goal setting and communication of high standards by the principal.

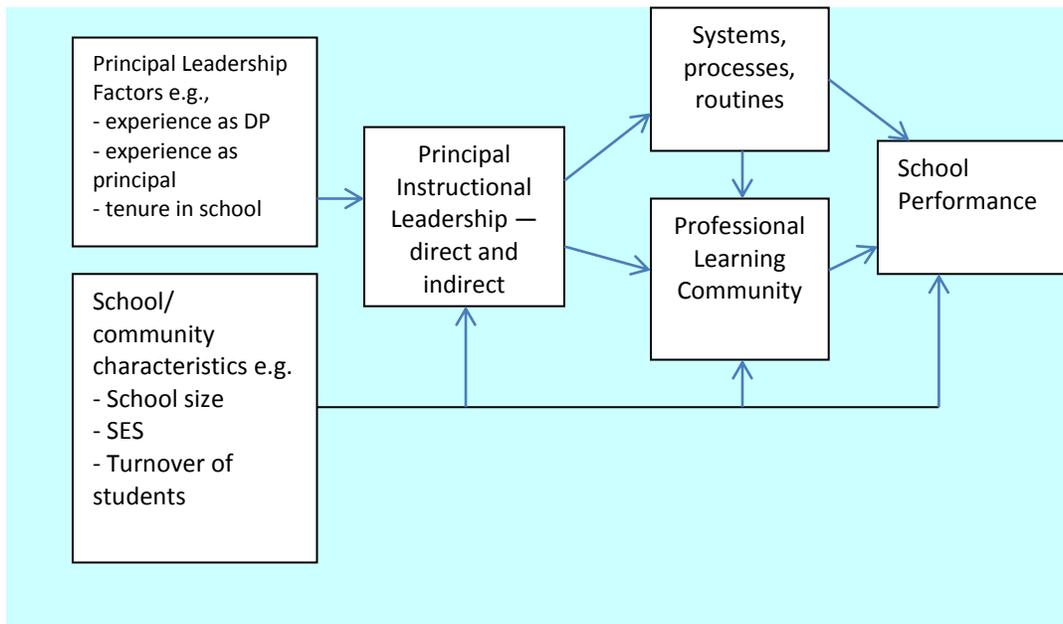
Inherent in the model of principal instructional leadership that I used was the belief that the principal may influence the staff attitudes and values that are encompassed in the concept of culture. Yet Schein (2004) does not assert that culture can be changed by directly trying to impact on attitudes and values. Schein referred to mechanisms that leaders can use including what they pay attention to, their role modelling, and their staff appointments and 'excommunications'. But he also stated that "...more difficult to control are the messages embedded in the organization's structure, its procedures and routine, its rituals, its physical layout, its stories and legends, and its formal statements about itself" (2004, p. 270). Thus, the means of change is not to focus on the culture per se, but to focus first on what people do.

That the direct effect of the principal was stronger than the indirect effect via the school culture was a surprise, perhaps one explained by the strength of the principal leadership factors (e.g., previous experience as a deputy or principal) in predicting school performance. Many authors note that the 'how' of leadership is largely a reflection of the personal qualities that leaders bring to their role (Hallinger,

2011; Mintzberg, 2009; Schein, 2004). Their success in winning support for change may rely as much on how they go about their daily tasks as what they do. Certainly, the problem solving aspects of the role have been highlighted by these results. A principal who effectively wins support from teachers and students in the way they make decisions and by the nature of their decisions, may have broader impacts than just those that are indirect via teaching and organisation. Explicit and effective goal setting and the communication of those goals to students and parents, for example, may directly impact on performance as well as indirectly via teacher actions.

Another explanation of the direct effects may be that principal instructional leadership needs to be modelled more explicitly as working through systems and routines, as well as the professional learning community of the school. Certainly the effectiveness of systems and routines in the school has been highlighted by the strength of cultural effects such as those included in the *Orderly Environment*, *Goals*, and *Problem Solving* dimensions. These in turn may impact on teachers' ability to work as a professional community. When the basics (student attendance and behaviour) don't work well, teachers are unlikely to be interested in analysing problems related to student achievement. This revised model is shown in Figure 18 and would be the model I would test in future iterations of this research. Orderliness seems to be critical and in turn, that sense of order must impact on teachers' efficacy and ability to work as a professional learning community. It would be useful in the future to explicitly test features of PLCs and systems and procedures as mediators of principal instructional leadership. It may be that systems help develop PLCs.

Figure 18 Revised Theoretical Framework for Conceptualising Principal Instructional Leadership



Applications of Research

This research has practical applications. For example, having a simple method of assessing relative school performance could add value to a wide variety of future research involving New Zealand secondary schools. The method developed in Study 1 allows performance levels to be tracked over time. The potential to link such data with future principal surveys could create a rich database for longitudinal research.

As is being seen currently with the introduction of National Standards in New Zealand, any move to assess comparative performance of schools is likely to be heartily resisted. This is partly because principals suspect that the community and government agencies will not compare apples with apples. There is a lack of trust that any system of assessing performance will be fair, and an active suspicion about the ability and integrity of agencies to respond to data in an appropriate way. With a system such as the one used in this research, where a school's performance was measured not only against a standard but also against schools of similar type and a school's own past performance, the results could be used to support self-evaluation. The Ministry of Education could offer added-value by providing a

report back to every school, instead of every school reporting to the Ministry. Doubtless, many will argue that schools should analyse and interpret data themselves. I don't adhere to this view entirely—too much reinventing of the wheel occurs and the expertise of those with analytical skills should be used to support schools instead of expecting every school to be an expert in the interpretation of data. While all leaders in schools need to learn to interpret data, it is a folly to expect all of them to be able to manage and interpret data unsupported given the variety of their backgrounds and challenges. A more systemic response would be to build up the ability of the system to support schools. This should equal the pressure that is exerted on schools to be accountable (Elmore, 2004).

A second application of this research would be a clearer focus in professional development programmes for schools leaders on the interrelationship between school management and leadership. It is gratifying to see government departments such as the Ministry of Education responding to research findings as appears to have happened with the results of the Best Evidence Synthesis on School Leadership and Student Outcomes (Robinson, et al., 2009). One perverse outcome of this may have been, however, an over-emphasis on direct instructional leadership in response to the assertion that the closer leadership is to teaching and learning, the greater the effects. One example of this is the manner that some New Zealand professional development has recently been designed; school “management” (indirect instructional leadership) has purposely been divided out from “leadership and assessment” (direct instructional leadership) so that the facilitators of the latter cannot provide guidance about the former. Both direct and indirect instructional leadership can impact on the quality of teaching and learning—the goal orientation is the critical factor. A lack of emphasis on the importance of the corresponding management aspects that support direct instructional leadership may result in novice principals trying to focus on the quality of instruction and setting unrealistic goals without having the infrastructure in place to support that ambitious agenda. Leaders need to understand that their role is complex and must adjust to the context they find themselves in.

Time for both a System and a Strategy

It is time to discuss a new way of working. Currently any talk of change seems to be restricted to academics. There is little or no discussion at the school and community level about how New Zealand needs to reform its current model of education to ensure every school is highly goal focused and those

that need support truly get it. Academics and commentators are calling for change, but this call is largely unheeded.

A common thread in recent arguments by New Zealand researchers who are critiquing the current system, (e.g., Bates, 2009; Bendall, 2009; Hattie, 2009a; Wylie, 2007, 2009), is the need for a collaborative, knowledge-building model—one that cannot be nurtured in a fully competitive education model such as the one New Zealand operates under. Whilst school autonomy has educational benefits, it does not necessarily result in improved educational outcomes (Fullan, 2006c; Organisation for Economic Co-operation and Development, 2008).

How to move to an alternative option is not usually so clearly laid out by those who know and understand the New Zealand system. Wylie (2009) suggested that methods of selection, development, and appraisal of principals all needed to be reviewed and suggested perhaps the answer lay in some regionally based purchase agreement with a non-government organisation. Hattie (2009a) suggested a Royal Commission be set up to assess directional changes. Hattie seemed to support a similar model to Wylie's—one that provided real support and challenge, but where schools worked together and used evaluation as "the cornerstone of decision-making" (p. 129). Nevertheless, critiques usually lack a detailed theory for improvement. Wylie's (2007) paper describing the Edmonton system does contain such a theory for improvement.

She suggested that New Zealand needed system-level change to produce a cohesive and collaborative educational community. Her recommendations were broad and compelling including that the country should have only one educational authority (rather than the numerous organisations that currently have formal roles) and that its role should include "clear lines of accountability" (Wylie, 2007, p. 23). It is beyond the scope of this thesis to investigate and recommend broad system changes in New Zealand, though current efforts at improvement appear, at best, to be piecemeal. One author who carried out a small investigation into New Zealand secondary principals' preparation for leadership suggested that New Zealand suffered from "serial incompetence and amateurism" in its approach to this development (Macpherson, 2009, p. 56).

Principal Recruitment and Development: First Steps to Change?

No one would argue that the quality of school leadership is assured. Principals who are instructional leaders as I have defined them, require a demonstrated commitment to teaching *all*, not just the easy to teach, and do not accept excuses for poor student performance. They ensure good systems and processes are in place to support teachers, but also demand high standards of teachers and students. To gain this calibre of leadership more consistently across the country, a different approach to principal recruitment and development is required.

A differentiated pre-principalship training programme should be mandatory for prospective principals. The training required prior to applying for a very small primary school (e.g., one or two teachers) is very different to that required for a large secondary school. Principals should be selected by boards from a pool of appropriately trained applicants. Our current way of managing appointments, as touched upon earlier, is part of the problem in that there is no quality control on appointments and one poor appointment can have a long and lasting effect on a school.

Similarly, we know that principals' attendance at one-day courses is not going to be effective in improving practice. That has already been established (Education Review Office, 2009; Timperley, et al., 2007). More debate needs to be had in New Zealand as to how principals are supported. A system that facilitates the analysis of department and school-level data and promotes real communities of professional practice is required. We can't solve our educational problems individually, but we could develop and support our principals and school boards (governors) more methodically.

An on-going and sustainable way of supporting all schools is required. New Zealand only has about 400 secondary schools, but we have multiple national support interventions currently focused on them for these schools to pick and choose between. There is no guarantee that those that need the support most will actually get it, or that these multiple support initiatives will be any more successful in improving outcomes in an enduring way for our most at-risk students, than any others have been. A networked approach to school performance and improvement where principals work in clusters with an ongoing evaluation and professional learning focus appears to be the most preferred option of at least some New Zealand educational researchers (e.g., Hattie, 2009a; Wylie, 2009). This model of support by one

person for a group of schools is commonly used in other countries and should be adopted here. The issue then, of course, would be that the quality of the support will be as good as the quality of the person or organisation providing it. Who makes these appointment decisions? The principals in the schools or the Ministry of Education? Perhaps only by working closely with principal organisations over time can the level of trust and professionalism that is required of all parties, be expected to develop in order to support system change. At present, there does not appear to be a high level of trust between layers of the system, and if New Zealand is to develop a more systemic response to its problems, I suggest that a higher level of trust and cohesion needs to develop first, and system changes need to be developed purposefully, transparently, and together.

Overall, the results of my study are highly comparable to others whether amounts of variance or effect sizes are considered. Many principals may literally have no effect on their school's performance, just as some teachers may have little effect. That they can have an impact is what this type of research points to—and more, this research points to what behaviours may be required in different situations. Every school is different. The 'right' leadership response to a school depends on the analysis, and response to, the challenges facing a school. It is the principal who has the power to make these decisions.

Future Research

Future research will involve a qualitative follow-up with a series of six interviews of principals in *Improving* and higher-performing schools of differing decile groups. This will allow me to delve into the motivations and actions of principals, and to further test the interpretation of the quantitative results found in Study 2. The systems, processes, and tools used by principals are of particular interest, as the identification and promulgation of these can be used to support other leaders. A follow up paper is also planned for early 2012 involving refinements to the methodology of Study 1 and another comparative study of secondary school performance patterns over four four-year periods (2004–2007, 2005–2008, 2006–2009, and 2007–2010). Finally, the opportunity to refine the leadership survey and to measure teacher satisfaction with systems and processes as well as indicators of professional community and test the path model proposed in Figure 18 would be desirable.

Conclusion

This research has been centred on the principal's power to influence school performance through the culture of the school. Six major findings resulted, though results have to be treated with caution due to the nature of the sampling.

First, schools categorised as *Improving Schools* tended to be located in low or middle SES communities, and were more often those already mid- or higher-performing. Structural models indicated that the early improvement battles appeared to have been won by gaining an orderly environment.

Second, the best predictor of whether a school was categorised as *Improving* was a principal's previous leadership experience as a deputy principal or principal, indicating that experience counts, and that if a school needs improving or is facing considerable challenge, it is no place for a neophyte.

Third, a principal's previous leadership experience accounted for up to 20% of the variance in school performance. This suggests that a lot more attention should be given to the systematic selection and development of principals. These results suggest that a structured career path that involves an apprenticeship as a deputy principal and practical experience in managing a school is a good predictor of success.

Fourth, different types of instructional leadership predicted school performance and improvement. Principals in high performing schools used more indirect instructional leadership and this had a larger impact on relative levels of school performance than direct instructional leadership in these 29 secondary schools. This is an important finding at a time when managerial behaviour is frequently being dismissed as relatively insignificant. This does not mean that the importance of direct instructional leadership is to be underestimated, but rather that the intertwined nature of these two types of behaviours has to be recognised as complementary—both are required. Principals in *Improving Schools* used more direct instructional leadership than others, and these were the only dimensions that had a significant effect. Direct instructional leadership was positively associated with both principal leadership

in schools that were improving and also schools that were currently lower-performing. This indicated that at least some principals in the lower-performing schools were making significant efforts at improving their schools' performance by taking a direct instructional role. Some of these schools would perhaps be categorised as *Improving Schools* in the future, but for now, those efforts were yet to be realised in school results. Certainly, principals in lower-performing schools used *Professional Development* and *Teaching and Curriculum* to more effect than those in mid-performing schools, perhaps because the need to take this leadership role was more evident.

Fifth, structural models subsequently indicated that while principal instructional leadership was mediated by the culture of the school, it had a stronger direct impact on school performance. This suggests that even where the culture of the school is not as cohesive or responsive as it could be, that the principal can still impact by setting high data-based goals with teachers and communicating high expectations. Academic goal orientation was affirmed as central to instructional leadership in this research.

Sixth, principals in schools that were improving, whilst using direct instructional leadership to impact on performance, already had a strong managerial infrastructure in place (indirect culture) while principals in higher-performing schools had an indirect effect via a strong teaching and curriculum infrastructure (direct culture). Thus, an orderly well-managed environment (indirect culture) appeared to be a prerequisite to the improvement. The impact of an orderly environment was the strongest cultural effect in higher-performing schools ($d = 0.55$). Those who want to dismiss some behaviours as managerial, need to be more cognisant of the importance of a strong infrastructure in effective schools.

One can't escape the human factor implicit in the principal's leadership role. The overarching message is that each context is different and requires a different response. Further, different behaviours may have more impact than others depending on the circumstances. To be effective, a principal has to adapt to the challenges of their particular environment, recognise its strengths and deficits, and proceed with caution—it is no small thing to try to take a large and diverse secondary school staff on a journey of change or improvement—they need to want to go there and the quality of a principal's decisions and

the way those decisions are made impacts on their ability to lead effectively. No bullet pointed list of behaviours will help someone who does not have good judgement when making decisions.

Clearly, the case studies that are intended as the next stage in this research need to investigate the validity of these findings. I have suggested that the principal has the positional power to make things happen, but they have to have the educational and interpersonal knowledge and skills to do the right things in the right way at the right times. This research has suggested what that may look like. When performance levels are low, a principal needs to gain a stable environment and lead instruction directly. Where performance levels are already high, a principal appears to gain most effect from problem solving and resourcing strategically as direct instructional leadership is likely to already be embedded in the school's culture.

Appendices

Appendix A: Overview of Schools' Performance Rankings

School	Performance indicators		Improvement indicators		Final ratings		
	Benchmark indicator	Value-added indicator	2 nd Value-added indicator	For all	For Māori		
A		Low (L)	L			Low	
B	High (H)					Mid	
C	H	L	L			Low	
D	H					Mid	
E	L	L		I	I	Low	Improving
F						Mid	
G	L		L			Low	
H	L				I	Mid	Improving
I		L				Mid	
J	H	H	H			High	
K	L			I	I	Mid	Improving
L						Mid	
M					I	Mid	Improving
N	H	H				High	
O	H		H	I		High	Improving
P	L		H	I	I	Mid	Improving
Q		H		I	I	Mid	Improving
R				I	I	Mid	Improving
S	H			I	I	Mid	Improving
T						Mid	
U			L			Mid	
V	H	H	H	I	I	High	Improving
W		H		I	I	Mid	Improving
X		H	H	I	I	High	Improving
Y	H	H	H			High	
Z	H	H	H			High	
AA		L	L			Low	

AB	L	L			Low
AC	L		H		Mid
AD	H			I	Mid Improving

Appendix B: Teacher Questionnaire

An Anonymous Survey for Teachers

Leadership in Secondary Schools

Please circle one in each category

Current Role Teacher Tutor/Form Teacher HOD/HOF AP/DP Specialist Classroom Teacher

Other: _____

Teaching Experience < 3 years 3-10 years >10 years > 20 years

Teaching Experience in this School < 2 years 2-10 years >10 years > 20 years

Administrative Experience None < 3 years 3-10 years >10 years > 20 years

(e.g. Years as Head of Dept or Faculty, or any type of role that has responsibility for others on a staff in any school)

Department English Maths Science Social Sciences Arts

Name other _____

Highest Educational Qualification (select highest)

- a) Less than a Bachelor's degree
- b) Bachelor's degree
- c) Post-graduate diploma
- d) Masters degree or above

		Tick one option				
	The principal....	almost never	rarely	some- times	often	almost always
1	protects staff from undue external pressure.					
2	and teaching staff share in leadership roles, using individual and team strengths.					
3	promotes school goals that specify high standards and expectations for all students.					
4	communicates the school's goals in clear, concrete terms.					
5	is the person teachers in this school turn to with instructional concerns or problems.					
6	ensures systematic monitoring information of all students' progress is used by staff.					
7	encourages teachers to attend professional development that is aligned to school goals.					
8	is an active participant in professional development with teachers.					
9	makes sure that appropriate resources for effective instruction are provided.					
10	successfully recruits high quality staff.					

		Tick one option				
	Staff members in this school....	almost never	rarely	some- times	often	almost always
11	work in a safe, supportive and orderly environment.					
12	assume responsibility for <i>all</i> students' learning.					
13	have a shared commitment to the school's academic goals.					
14	believe school standards to be both challenging and attainable.					
15	are helped to interpret assessment data for instructional implications.					
16	are provided with useful feedback after classroom observations are carried out.					
17	are provided with professional development on instructional best practices.					
18	are encouraged to attend professional development activities that are aligned to school goals.					
19	think school budgets are well managed.					
20	think time on professional development is used productively.					

		Tick one option				
	In this school....	almost never	rarely	some- times	often	almost always
21	student discipline problems are handled with fairness, emphasising behaviour, not personality.					
22	instructional time is protected from interruptions.					
23	data driven academic goals are set in collaboration with teachers.					
24	school goals are set that promote high standards and expectations for all students.					
25	teachers are helped to interpret assessment data for instructional implications.					
26	classroom observations that focus on the link between outcomes and teaching are carried out for appraisal purposes.					
27	professional development is planned around the needs of students.					
28	professional development is planned with a focus on the school's academic goals.					
29	useful teaching resources are provided for teachers.					
30	resources are fairly allocated to support teachers' efforts to improve learning.					

		Tick one option				
Our leadership ensures that.....		almost never	rarely	some- times	often	almost always
31	teachers who are not serving students well are challenged to improve.					
32	teachers take responsibility not only for their own actions and students, but also for those of others.					
33	teachers do not dismiss inability to reach school goals as an inevitable consequence of home environment.					
34	departmental goals are set based on information about what students need to know and be able to do.					
35	assessment data are used to improve teaching.					
36	teachers help each other by discussing their students' results and developing more effective teaching strategies.					
37	professional development focuses on the relationship between what is taught and what is learnt.					
38	when professional development challenges teachers' practice, we discuss the tensions between current practice and the proposed change.					
39	problems of teachers, students and parents are resolved appropriately.					
40	staff issues are taken seriously but are balanced with the need to serve the students well.					

		Tick one option				
	To what degree is the principal involved in these activities?	almost never	rarely	some- times	often	almost always
41	Challenging teachers who are not serving students well, to improve.					
42	Encouraging teachers to take responsibility not only for their own actions and students, but also for those of others.					
43	Challenging teachers to not dismiss inability to reach school goals as an inevitable consequence of home environment.					
44	Ensuring departmental goals are based on information about what students need to know and be able to do.					
45	Ensuring that assessment data are used to improve teaching.					
46	Helping teachers discuss their students' results with others and collaboratively seek ways to improve outcomes.					
47	Ensuring professional development focuses on the relationship between what is taught and what is learnt.					
48	Ensuring there is discussion of the tensions between current practice and any proposed change.					
49	Ensuring problems of teachers, students and parents are resolved.					
50	Ensuring that staff issues are taken seriously but are balanced with the need to serve the students well.					

		Tick one option					
	Who <i>mainly</i> carries out this role in your school?	Principal	DP/AP	HOD or HOF	Dean	No one	Name other role e.g. RTLB
51	Setting behaviour standards.						
52	Ensuring a safe and orderly environment exists for teachers and learners.						
53	Setting the school's academic goals and expectations.						
54	Encouraging teachers to set high standards for student achievement.						
55	Helping teachers to interpret assessment data for instructional implications.						
56	Carrying out classroom observations of teaching practice.						
57	Ensuring teachers attend professional development activities aligned to school/departmental goals.						
58	Organising the professional development programme.						
59	Setting departmental budgets.						
60	Recruiting and appointing teachers.						

Appendix C: Questionnaire Items by Dimension

	Item	Principal Dimensions	Item	Cultural Dimensions
Direct Dimension				
Goals	3	The principal promotes school goals that specify high standards and expectations for all students.	13	Staff members in this school have a shared commitment to the school's academic goals.
	4	The principal communicates the school's goals in clear, concrete terms.	14	Staff members in this school believe school standards to be both challenging and attainable.
	44	The principal ensures departmental goals are based on information about what students need to know and be able to do.	23	In this school data driven academic goals are set in collaboration with teachers.
			24	In this school, goals are set that promote high standards and expectations for all students.
			34	Our leadership ensures that departmental goals are set based on information about what students need to know and be able to do.
Professional Development	7	The principal encourages teachers to attend professional development that is aligned to school goals.	17	Staff members in this school are provided with professional development on instructional best practices.
	8	The principal is an active participant in professional development with teachers.	18	Staff members in this school are encouraged to attend professional development activities that are aligned to school goals.
	47	The principal ensures professional development focuses on the relationship between what is taught and what is learnt.	27	In this school professional development is planned around the needs of students.
	48	The principal ensures there is discussion of the tensions between current practice and any proposed change.	28	In this school professional development is planned with a focus on the school's academic goals.
			37	Our leadership ensures that professional development focuses on the relationship between what is taught and what is learnt

			38	Our leadership ensures that when professional development challenges teachers' practice, we discuss the tensions between current practice and the proposed change.
Teaching and Curriculum	5	The principal is the person teachers in this school turn to with instructional concerns or problems.	15	Staff members in this school are helped to interpret assessment data for instructional implications.
	6	The principal ensures systematic monitoring information of all students' progress is used by staff.	16	Staff members in this school are provided with useful feedback after classroom observations are carried out.
	45	The principal ensures that assessment data are used to improve teaching.	25	In this school data driven academic goals are set in collaboration with teachers
	46	The principal helps teachers discuss their students' results with others and collaboratively seek ways to improve outcomes.	26	In this school classroom observations that focus on the link between outcomes and teaching are carried out for appraisal purposes.
			35	Our leadership ensures that assessment data are used to improve teaching.
			36	Our leadership ensures that teachers help each other by discussing their students' results and developing more effective teaching strategies.
Collective Responsibility	41	The principal challenges teachers who are not serving students well, to improve.	31	Our leadership ensures that teachers who are not serving students well are challenged to improve.
	42	The principal encourages teachers to take responsibility not only for their own actions and students, but also for those of others.	32	Our leadership ensures that teachers take responsibility not only for their own actions and students, but also for those of others.
	43	The principal ensures that teachers do not dismiss inability to reach school goals as an inevitable consequence of home environment.	33	Our leadership ensures that teachers do not dismiss inability to reach school goals as an inevitable consequence of home environment.

Indirect Dimensions				
Orderly Environment	1	The principal protects staff from undue external pressure.	11	Staff members in this school work in a safe, supportive and orderly environment.
	2	The principal and teaching staff share in leadership roles, using individual and team strengths.	12	Staff members in this school assume responsibility for <i>all</i> students' learning.
			21	In this school student discipline problems are handled with fairness, emphasising behaviour, not personality.
			22	In this school instructional time is protected from interruptions.
Strategic Resourcing	9	The principal makes sure that appropriate resources for effective instruction are provided.	19	Staff members in this school think school budgets are well managed.
	10	The principal successfully recruits high quality staff.	20	Staff members in this school think time on professional development is used productively.
			29	In this school useful teaching resources are provided for teachers.
			30	In this school resources are fairly allocated to support teachers' efforts to improve learning
Problem Solving	49	The principal ensures problems of teachers, students and parents are resolved.	39	Our leadership ensures that problems of teachers, students and parents are resolved appropriately.
	50	The principal ensures that staff issues are taken seriously but are balanced with the need to serve the students well.	40	Our leadership ensures that staff issues are taken seriously but are balanced with the need to serve the students well.

Note: Wording of stems on some items has been changed for consistency reasons. See Appendix B for the original questionnaire.

Appendix D: Correlations of Dimensions

Correlations for the items across the principal dimensions

Principal Dimensions	Goals	Orderly Environment	Professional Development	Problem Solving	Teaching & Curriculum	Collective Responsibility	Strategic Resourcing
Goals	—						
Orderly Environment	.63	—					
Professional Development	.76	.65	—				
Problem Solving	.66	.69	.71	—			
Teaching & Curriculum	.79	.64	.80	.68	—		
Collective Responsibility	.68	.57	.71	.67	.76	—	
Strategic Resourcing	.67	.63	.69	.67	.65	.58	—

Correlations for the items across the cultural dimensions

Cultural Dimensions	Goals	Orderly Environment	Professional Development	Problem Solving	Teaching & Curriculum	Collective Responsibility	Strategic Resourcing
Goals	—						
Orderly Environment	.76	—					
Professional Development	.71	.65	—				
Problem Solving	.65	.68	.60	—			
Teaching & Curriculum	.77	.63	.77	.56	—		
Collective Responsibility	.64	.56	.60	.59	.61	—	
Strategic Resourcing	.66	.73	.70	.61	.60	.54	—

Appendix E: Letter to Principals

10 East St
Hamilton
September 2008

Dear XXXXX

PhD Research Project —Leadership in Secondary Schools

My name is Linda Bendikson, a PhD student at the University of Auckland. You may know me from my role in the Ministry of Education: I am the regional manager of the ministry in this region but I am writing to you in a private capacity as a student wishing to carry out research on leadership in secondary schools.

This academic interest has developed out of my work where I am trying to identify good practice in schools and share it in order to help all schools. The aim of this research is to identify what leadership practices are carried out in secondary schools, who carries them out and how they impact on student outcomes. The ultimate aim is to develop tools and strategies to help principals in secondary schools.

This research will examine the relationship between secondary school leadership practices (of both the principal and other leaders in the school) and school climate and student outcomes. However, it also investigates other variables that may impact on student outcomes e.g., the level of experience of teachers; the level of experience of principals; the amount of administrative experience of teachers and principals etc.

The study is supervised by Doctors Viviane Robinson (the lead writer of the forthcoming Best Evidence Synthesis on Leadership and Student Outcomes: What works and why') and John Hattie, from the University of Auckland and it is hoped that this study will contribute to the scarce knowledge we currently have about New Zealand leadership (and secondary school leadership in particular) and the potential impact it can have on student outcomes.

While NCEA data will be used to help define 'student outcomes' and how they are linked to leadership behaviours, I intend to take a broad and inclusive view that is cognisant of all the shortcomings of such data. I will not use crude 'League Tables' but rather the following type of criteria to define 'high performing' schools:

- Consistently improving schools over a number of years;
- Schools that score higher than an arbitrary benchmark;
- Schools that score higher than their decile average; and
- Schools that do particularly well for Maori students.

Patterns across schools will be analysed and linked to leadership behaviours. No individual school will be named or able to be identified through the study.

What would be involved for you if you agreed to take part?

You would need to:

- Communicate to staff about allowing me to provide them with an anonymous survey about leadership practices in the school (see the attached example of the Teacher's Questionnaire).
- Arrange to have the questionnaire, information sheets and stamped return envelope distributed to all staff e.g. via cubby holes. The questionnaire will take approximately 10 minutes for teachers to complete and will be completely anonymous. They will post their response back.
- Answer a brief questionnaire (see the attached example of the Principal's Questionnaire) about yourself. This should take no more than five minutes.

Would you and your staff's privacy be protected?

- Your staff's responses will be completely anonymous anyway.
- While your survey is not anonymous as it needs to be linked to the school's data, your anonymity will be protected by a third party who will open the staff responses and code them. Only she will know which school matches which questionnaires as she will re-code the data. She will sign a confidentiality agreement.
- It may be that I wish to follow up on some schools to investigate the data more. If your school is one of those, the third party will contact you and ask your explicit permission only if you have already indicated that you would be happy to be contacted for a follow-up-interview on your consent form (see attached).

So as you can see, I will not know which data is your school's data. If you want any more information at this stage, please phone me (027-278-6261).

If you are willing and able to participate, could you read the attached information sheet and complete and return the attached consent form by fax before the end of October. I will make contact with you by phone to answer all your questions and to consult you over next steps and arrange for staff surveys to be sent to your school.

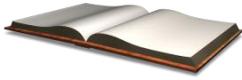
If you do not wish to participate, please do not respond and I will make no further contact with you about this matter. I can assure you that if you decide not to participate in the research, that this will have no effect on our professional relationship.

Thank you for giving this matter your consideration.

Kind regards

Appendix F: Questionnaire for Principals

A Survey for Principals



Leadership in Secondary Schools

Please circle one answer in each category

1. Total teaching experience 1- 4 years 5-10 years >10 years > 20 years

2. Previous experience in any school as HOD/HOF

None 1-4 years 5-10 years >10 years > 20 years

3. Previous experience in any school as AP/DP

None 1- 4 years 5-10 years >10 years > 20 years

4. Total experience as principal

< 1 year 1-4 years 5-10 years >10 years > 20 years

5. Length of service as principal in this school

< 2 years 2-5 years 5-10 years >10 years

6. Highest educational qualification

a) Less than a Bachelor's degree

b) Bachelor's degree

c) Post-graduate diploma

d) Masters degree or above

7. Gender Male Female

8. Number of teachers (FTEs)

a) Less than 40 teachers

b) 40-65 teachers

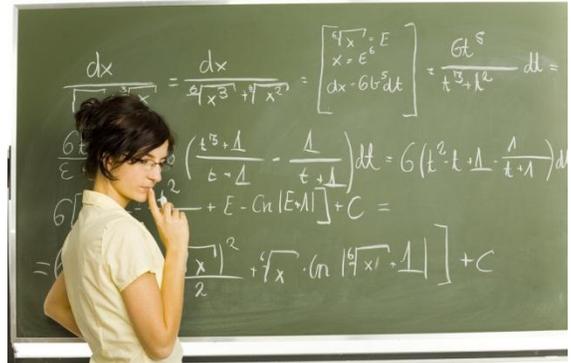
c) More than 65 teachers

9. Approximate number of teachers in the school that have been appointed during your term as principal in this school

< 5 5-10 10-20 > 20

10. Excluding those students who leave at the end of the year, estimate your 2008 student transience (approximate number of students at any level that would leave during the year divided by the total number of students x 100).

<10% 11-20% 21-30% 31-40% >40%



Thank you for your time and help — Please fax to:xxxxxxxxxx

**Appendix G: Effect Size Results of Principal Instructional Leadership
Compared to that of Robinson et al. (2008)**

Indirect Principal Dimensions	Robinson et al., 2008	Bendikson, 2011 Higher- and mid-performing secondary schools	Bendikson, 2011 Higher- and lower- performing secondary schools	Bendikson, 2011 Improving Schools
<i>Orderly Environment—</i> Ensuring an orderly and supportive environment	0.27	0.28	0.13	0.00
<i>Strategic Resourcing</i>	0.31	0.36	0.44	0.13
<i>Problem Solving</i>		0.41	0.16	0.11
Direct Principal Dimensions				
<i>Goals—</i> Establishing goals and expectations	0.42	0.31	0.36	0.26
<i>Professional Development—</i> Promoting and participating in teacher learning and development	0.84	0.17	0.11	0.04
<i>Teaching and Curriculum—</i> Planning, coordinating, and evaluating teaching and the curriculum	0.42	0.21	0.11	0.19
<i>Collective Responsibility—</i> Developing a sense of collective responsibility		0.24	0.15	0.23

Appendix H: Effect Size Results of Cultural Dimensions

Indirect Principal Dimensions	Higher-mid Performing effect sizes	Higher-lower Performing effect sizes	Improving
<i>Orderly Environment</i> —Ensuring an orderly and supportive environment	0.55	0.53	0.04
<i>Strategic Resourcing</i>	0.38	0.48	0.03
<i>Problem Solving</i>	0.45	0.43	0.19
Direct Principal Dimensions			
<i>Goals</i> —Establishing goals and expectations	0.42	0.39	0.21
<i>Professional Development</i> —Promoting and participating in teacher learning and development	0.18	0.04	0.00
<i>Teaching and Curriculum</i> —Planning, coordinating, and evaluating teaching and the curriculum	0.14	-0.02	0.23
<i>Collective Responsibility</i> —Developing a sense of collective responsibility	0.33	0.26	0.19

References

- Alig-Mielcarek, J. M., & Hoy, W. K. (2005). Instructional leadership: Its nature, meaning and influences. In W. K. Hoy & C. Miskel (Eds.), *Educational Leadership and Reform* (pp. 29-51). Greenwich: IAP.
- Alton-Lee, A. (2003). *Quality teaching for diverse students in schooling: Best evidence synthesis: Medium Term Strategy Policy Division*, Ministry of Education.
- Ammar, S., Bifulco, R., Duncombe, W., & Wright, R. (2000). Identifying low-performance public schools. *Studies in Educational Evaluation, 26*, 259-287.
- Arbuckle, J. L. (2003). *Amos version 5.0*. Chicago: Small Waters.
- Bamburg, J. D., & Andrews, R. L. (1991). School goals, principals, and achievement. *School Effectiveness and School Improvement, 2*(3), 175-191.
- Bates, T. (2009). National mission or mission impossible? In J. Langley (Ed.), *Tomorrow's Schools 20 years on* (pp. 79-89). Auckland: Cognition Institute.
- Bendall, M. (2009). A leadership perspective. In J. Langley (Ed.), *Tomorrow's Schools 20 years on* (pp. 105-119). Auckland: Cognition Institute.
- Bentler, P. M. (1992). On the fit of models to covariances and methodology to the Bulletin. *Psychological Bulletin, 112*(400-404).
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*, 588-606.
- Blank, R. K. (1987). The role of principal as leader: Analysis of variation in leadership of urban high schools. *Journal of Educational Research, 81*(2), 69-80.
- Bolam, R., & Turner, C. (2003). Heads of secondary school subject departments and the improvement of teaching and learning. In M. Wallace & L. Poulson (Eds.), *Educational leadership and management* (pp. 133-148). London: Sage.
- Bollen, K. A. (1989). A new incremental fit index for general structural models. *Sociological Methods and Research, 17*, 303-316.
- Bossert, S. T., Dwyer, D. C., Rowan, B., & Lee, G. V. (1982). The instructional management role of the principal. *Educational Administration Quarterly, 18*(3), 34 - 64.
- Brewer, D. J. (1993). Principals and student outcomes: Evidence from U.S. high schools. *Economics of Education Review, 12*(4), 281-292.
- Brown, L. I. (2001). *A meta-analysis of research on the influence of leadership on student outcomes*. Unpublished Ph.D., Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445-455). Newbury Park, CA: Sage.
- Bryk, A. S., & Schneider, B. (2002). *Trust in schools: A core resource for improvement*. New York: Russel Sage Foundation.
- Bryk, A. S., Sebring, P. B., Allensworth, E., Luppescu, S., & Easton, J. Q. (2010). *Organizing schools for improvement: Lessons from Chicago*. Chicago: The University of Chicago Press.
- Bryman, A. (2004). *Social Research Methods*. New York: Oxford University Press Inc.
- Byrne, B. M. (2001). *Structural Equation Modeling with AMOS: Basic concepts, applications, and programming*. London: University of Ottawa.
- Caygill, R., Lang, K., & Cowles, S. (2010). *School context: The school context for year 5 students' mathematics and science achievement in 2006: New Zealand results from the Trends in International Mathematics and Science Study (TIMSS)*. Wellington: Ministry of Education.
- Chamberlain, M. (2006). *Reading literacy in New Zealand: An overview of New Zealand's results from the progress in international reading literacy study (PIRLS) 2005/2006*. Wellington: Ministry of Education.

- Cheng, Y. C. (1991). Leadership style of principals and organisational process in secondary schools. *Journal of Educational Administration*, 29(2), 25-37.
- Chenoweth, K. (2007). *It's being done: Academic success in unexpected schools*. Cambridge, MA: Harvard Education Press.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. London: Routledge.
- Collins, J. (2001). *Good to great: Why some companies make the leap...and others don't*. New York: Harper-Collins.
- Conley, S. (1991). Review of research on teacher participation in school decision making. In G. Grant (Ed.), *Review of Research in Education* (Vol. 17, pp. 225-266). Washington: American Educational Research Association.
- Conroy, D. E., Metzler, J. N., & Hofer, S. M. (2003). Factorial invariance and latent mean stability of performance failure appraisals. *Structural Equation Modeling: A Multidisciplinary Journal*, 10, 401-422.
- Daniels, H., Bizar, M., & Zemelman, S. (2001). *Rethinking high school: Best practice in teaching, learning, and leadership*. Portsmouth, NH: Heinemann.
- Dinham, S. (2005). Principal leadership for outstanding educational outcomes. *Journal of Educational Administration*, 43(4), 338-356.
- DuFour, R., Eaker, R., & Dufour, R. (2005). *On common ground*. USA: Solution Tree.
- Dwyer, D. (1986). Understanding the principal's contribution to instruction. *Peabody Journal of Education*, 63(1), 3-18.
- Earl, L., & Katz, S. (2006). Leading schools in a data-rich world. In K. L. P. Hallinger (Ed.), *Second International Handbook of Leadership and Administration*. Dordrecht: Kluwer.
- Education Review Office. (2007). *The collection and use of assessment information: Good practice in secondary schools*. Wellington: Education Review Office
- Education Review Office. (2009). *Managing professional learning and development in secondary schools*. Wellington: Education Review Office.
- Elmore, R. (2004). *School reform from the inside out: Policy, practice and performance*. Cambridge: Harvard Education Press.
- Elmore, R. (2007). *Educational improvement in Victoria*. State Government Victoria: Department of Education.
- Fay, B. (1987). *Critical social science: Liberation and its limits*. Cambridge: Polity Press.
- Firestone, W. A., & Herriott, R. E. (1982). Prescriptions for effective elementary schools don't fit secondary schools. *Educational Leadership*, 40(3), 51-53.
- Firestone, W. A., & Rosenblum, S. (1988). Commitment in urban high schools. *Educational Evaluation and Policy Analysis*, 10(4), 285-299.
- Foster, R. (2004). Leadership and secondary school improvement: Case studies of tensions and possibilities. *International Journal of Leadership in Education*, 8(1), 35-52.
- Fullan, M. (2006a). The future of educational change: System thinkers in action. *Journal of Educational Change*, 7(3), 113-122.
- Fullan, M. (2006b). Sustaining leadership in complex times: An individual and system solution. In B. Davies (Ed.), *Sustaining and Developing Leaders*. London: Sage Publications.
- Fullan, M. (2006c). *Turnaround leadership*: Jossey-Bass.
- Fullan, M., Bertani, A., & Quinn, J. (2004). New lessons for district wide reform. *Educational Leadership*, 61(7), 42-46.
- Fullan, M., Cuttress, C., & Kilcher, A. (2005). 8 forces for leaders of change. *Journal of Staff Development*, 26(4), 54-64.
- Fullan, M., & Newton, E. E. (1988). School principal and change processes in the secondary school. *The Canadian Journal of Education* 13(3), 404-422.

- Gaziel, H. H. (2007). Re-examining the relationship between principal's instructional/educational leadership and student achievement. *Journal of Social Science, 15*(1), 17-24.
- Goldring, E. B., & Pasternak, R. (1994). Principals' coordinating strategies and school effectiveness. *School Effectiveness and School Improvement, 5*(3), 239-253.
- Goldstein, H. (1997). Methods in school effectiveness research. *School Effectiveness and School Improvement, 8*(4), 369-395.
- Goldstein, H., & Spiegelhalter, D. J. (1996). League tables and their limitations: Statistical issues in comparisons of institutional performance. *Journal of the Royal Statistical Society, Series A, 159*, 385-443.
- Good, T. L., & Brophy, J. E. (1986). School effects. In M. C. Wittrock (Ed.), *Handbook of Research on Teaching*. New York: MacMillan.
- Gray, J., Goldstein, H., & Jesson, D. (1996). Changes and improvement in schools' effectiveness: Trends over five years. *Research Papers in Education, 11*(1), 35-51.
- Gray, J., Goldstein, H., & Thomas, S. (2001). Predicting the future; the role of past performance in determining trends in institutional effectiveness at A level. *British Educational Research Journal, 27*(4), 391-405.
- Hallinger, P. (2005). Instructional leadership and the school principal: A passing fancy that refuses to fade away. *Leadership and Policy in Schools, 4*(3), 221-239.
- Hallinger, P. (2011). Leadership for learning: Lessons from 40 years of empirical research. *Journal of Educational Administration, 49*(2), 125-142.
- Hallinger, P., & Heck, R. H. (1996). Reassessing the principal's role in school effectiveness: A review of empirical research, 1980 – 1995. *Education Administration Quarterly, 32*(1), 5-44.
- Hallinger, P., & Heck, R. H. (1998). Exploring the principal's contribution to school effectiveness: 1989 - 1995. *School Effectiveness and School Improvement, 9*(2), 157-191.
- Hallinger, P., & Murphy, J. (1985). Assessing the instructional management behaviour of principals. *The Elementary School Journal, 86*(2), 217-247.
- Hallinger, P., & Murphy, J. (1987). Instructional leadership in the school context. In W. Greenfield (Ed.), *Instructional leadership: Concepts, issues and controversies* (pp. 179-203). Boston: Allyn & Bacon, Inc.
- Halverson, R. R. (2007). Systems of practice and professional community: The Adams case. In J. P. Spillane & J. B. Diamond (Eds.), *Distributed leadership in practice* (pp. 35-62). New York: Teachers College Press.
- Hammond, J. S., Keeney, R. L., & Raiffa, H. (2006). The hidden traps in decision making. *Harvard Business Review, January*, 118-126.
- Hargreaves, A., & Goodson, I. (2006). Educational change over time? The sustainability and nonsustainability of three decades of secondary school change and continuity. *Educational Administration Quarterly, 42*, 3-40.
- Hattie, J. (2009a). Tomorrow's Schools - yesterday's news: A quest for a new metaphor. In J. Langley (Ed.), *Tomorrow's Schools 20 years on* (pp. 123-132). Auckland: Cognition Institute.
- Hattie, J. (2009b). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.
- Heck, R. H. (1992). Principals' instructional leadership and school performance: Implications for policy development. *Educational Evaluation and Policy Analysis, 14*(1), 21-34.
- Heck, R. H. (1993). School context, principal leadership and achievement: The case of secondary schools in Singapore. *The Urban Review, 25*(2), 151-166.
- Heck, R. H. (2000). Examining the impact of school quality on school outcomes and improvement: A value-added approach. *Educational Administration Quarterly 36*(4), 513-552.

- Heck, R. H., Larsen, & Marcoulides, G. A. (1990). Instructional leadership and school achievement: Validation of a causal model. *Educational Administration Quarterly*, 26(2), 94-125.
- Heck, R. H., & Marcoulides, G. A. (1996). School culture and performance: Testing the invariance of an organisational model. *School Effectiveness and School Improvement*, 7(1), 76-95.
- Heck, R. H., Marcoulides, G. A., & Lang, P. (1991). Principal instructional leadership and school achievement: The application of discriminant techniques. *School Effectiveness and School Improvement*, 2(2), 115-135.
- Heck, R. H., & Moriyama. (2010). Examining relationships among elementary schools' contexts, leadership, instructional practices, and added-year outcomes: A regression discontinuity approach. *School Effectiveness and School Improvement*, 21(4), 377-408.
- Herriott, R. E., & Firestone, W. A. (1984). Two images as schools as organizations: A refinement and elaboration. *Educational Administration Quarterly*, 20(4), 41-57.
- Highfield, C. (2010). Disparity in student achievement within and across secondary schools: An analysis of department results in English, maths and science in New Zealand. *School Leadership and Management*, 30(2), 171-190.
- Hipkins, R. (2004). *National Survey of Secondary Schools 2003*. Wellington: New Zealand Council for Educational Research.
- Hipkins, R. (2006). *Taking the pulse of NCEA: Findings from the NZCER national survey of secondary schools*. Wellington: New Zealand Council for Educational Research.
- Hipkins, R., Vaughan, K., Beals, F., & Ferral, H. (2004). *Learning Curves: Meeting student learning needs in an evolving qualifications regime: Shared pathways and multiple tracks: Key findings of second report*. Wellington: New Zealand Council for Educational Research.
- Hipkins, R., Wylie, C., & Hodgen, E. (2007). *Can standards-based qualifications improve low-performing students' engagement in learning, and their achievement?* Paper presented at the American Educational Research Association Conference, Chicago.
- Hofman, R. H., Hofman, R. H., & Guldmond, H. (2001). The effectiveness of cohesive schools. *International Journal of Leadership in Education*, 4(2), 115-135.
- Hornig, E. L., Klasik, D., & Loeb, S. (2009). Principal time-use and school effectiveness. *National Center for Analysis of Longitudinal Data in Education Research - a working paper*, 34, 1-48
- Hoy, W. K., Hannum, J., & Tschannen-Moran. (1998). Organizational climate and student achievement: A parsimonious longitudinal view. *Journal of School Leadership*, 8, 336-359.
- Hoy, W. K., & Tarter, C. J. (1992). Measuring the health of the school climate: A conceptual framework. *National Association of Secondary School Principals Bulletin*, 76, 74-79.
- Hoy, W. K., Tarter, C. J., & Bliss, J. R. (1990). Organizational climate, school health, and effectiveness: A comparative analysis. *Educational Administration Quarterly*, 26, 260-279.
- Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 158-176). Thousand Oaks, CA: Sage.
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1-55.
- Jacobson, S. (2011). Leadership effects on student achievement and sustained school success. *International Journal of Educational Management*, 25(1), 33-44.
- James, A., Montelle, C., & Williams, P. (2008). From lessons to lectures: NCEA mathematics results and first-year mathematics performance. *International Journal of Mathematical Education in Science and Technology*, 39(8), 1037-1050.
- Jöreskog, K. G., & Sörbom, D. (1992). *LISREL VIII: Analysis of linear structural relations*. Mooresville, IN: Scientific Software.

- Kear, A. (2008). NCEA Workshop, *Ministry of Education*. Hamilton.
- Kerry, T. (2005). The evolving role of the head of department. *London Review of Education*, 3(1), 65-80.
- Kleine-Kracht, P. (1993). Indirect instructional leadership: An administrator's choice. *Education Administration Quarterly*, 29(2), 187-212.
- Krajewski, R. J. (1978). Secondary principals want to be instructional leaders. *The Phi Delta Kappan*, 60(1), 65.
- Lange, D. (1988). *Tomorrow's Schools: The reform of educational administration in New Zealand*. Wellington: Government Printer.
- Lee, V. E., Bryk, A. S., & Smith, J. B. (1993). The organization of effective secondary schools. *Review of Research in Education*, 19, 171-267.
- Lee, V. E., & Smith, J. B. (1996). Collective responsibility for learning and its effects on gains in achievement for early secondary school students. *American Journal of Education*, 104(2), 103-147.
- Leithwood, K. (1994). Leadership for school restructuring. *Education Administration Quarterly*, 30(4), 498-518.
- Leitner, D. (1994). Do principals affect student outcomes: An organizational perspective. *School Effectiveness and School Improvement*, 5(3), 219-238.
- Little, J. W. (2002). Professional community and the problem of high school reform. *International Journal of Educational Research*, 37, 693-714.
- Louis, K. S., Kruse, S., & Raywid, M. A. (1996). Putting teachers at the centre of reform: Learning schools and professional communities. *NASSP Bulletin*, May.
- Louis, K. S., & Miles, M. B. (1990). *Improving the urban high school: What works and why*. New York: Teachers College Press
- Louis, K. S., & Miles, M. B. (1991). Managing reform: Lessons from urban high schools. *School Effectiveness and School Improvement*, 2(2), 75-96.
- Louis, K. S., & Wahlstrom, K. (2011). Principals as cultural leaders. *Phi Delta Kappan*, 92(5), 52-56.
- Luyten, H. (1994). *Stability of school effects in secondary education*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.
- Luyten, H., Tymms, P., & Jones, P. (2009). Assessing school effects without controlling for prior achievement? *School Effectiveness and School Improvement*, 20(2).
- MacCullum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1, 130-149.
- Macpherson, R. (2009). How secondary principals view New Zealand's leadership preparation and succession strategies: Systematic professionalisation or amateurism through serial incompetence? *Leading and Managing*, 15(2), 45-58.
- Madjar, I., & McKinley, E. (2011). *Understanding NCEA*. Wellington: NZCER Press.
- Mankins, M. C., & Steele, R. (2006). Stop making plans; Start making decisions. *Harvard Business Review*, January, 76-84.
- Marcoulides, G. A., & Heck, R. H. (1993). Organizational culture and performance: Proposing and testing a model. *Organization Science*, 4(2, May), 209-225.
- Marks, H. M., & Louis, K. S. (1999). Teacher empowerment and the capacity for organizational learning. *Education Administration Quarterly*, 35, 707-750.
- Marks, H. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly*, 39(3), 370-397.
- Marsh, H. W., Bella, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin*, 103, 391-410.

- Martin, W. J., & Willower, D. J. (1981). The managerial behavior of high school principals. *Education Administration Quarterly*, 17(1), 69-90.
- Marzano, R. J., Walters, T., & McNulty, B. (2005). *School Leadership that works: From research to results*. Aurora, CO: ASCD and McREL.
- McLaughlin, M. W., & Talbert, J. E. (2007). Building professional learning communities in high schools: Challenges and promising practices. In L. Stoll & K. S. Louis (Eds.), *Professional learning communities: Divergence, depth and dilemmas* (pp. 151-165). Maidenhead, Berkshire: Open University Press.
- Meyer, L., McClure, J., Walkey, F., McKenzie, L., & Weir, F. (2006). *Final Report: The impact of the NCEA on student motivation*. Wellington: Victoria University of Wellington.
- Ministry of Education. (2007). *State of education in New Zealand 2007*. Wellington: Strategy and System Performance, Ministry of Education.
- Ministry of Education. (2008). *Ka hikitia: Managing for success*. Wellington: Ministry of Education.
- Ministry of Education. (n.d.). Background paper - Ongoing improvements to NCEA. Retrieved 21 January, 2008, from www.minedu.govt.nz
- Mintzberg, H. (2009). *Managing*. San Francisco: Berrett-Koehler Publishers, Inc.
- Mintzberg, H., & Westley, F. (2001). Decision making: It's not what you think. *MIT Sloan Management Review*, 42(3), 89-93.
- Muijs, D., Harris, A., Chapman, C., Stoll, L., & Russ, J. (2004). Improving schools in socio-economically disadvantaged areas: A review of research evidence. *School Effectiveness and School Improvement*, 15(2), 149-175.
- Murphy, J. (1990). Principal instructional leadership. In R. S. Lott & P. W. Thurston (Eds.), *Advances in educational administration: Changing perspectives on the school* (Vol. 1 B, pp. 163-200). Greenwich: JAI Press Inc.
- Murphy, J., & Hallinger, P. (1985). Effective high schools - What are the common characteristics? *National Association of Secondary School Principals Bulletin*, 69, 18-22.
- New Zealand Qualification Authority. (2009). Updates from the New Zealand Qualifications Authority. *New Zealand Education Gazette*, 13 July.
- New Zealand Qualifications Authority. (2008). Selection of Assessed Work for Moderation. Retrieved S2008/013, from www.nzqa.govt.nz/publications/circulars
- New Zealand Qualifications Authority. (2009). NCEA web-based information. Retrieved February 20, 2009, from www.nzqa.govt.nz
- Newmann, F. M., & Wehlage, G. G. (1995). *Successful school restructuring: A report to the public and educators*. Madison, Wisconsin: Center on organization and restructuring of schools.
- Ogawa, R. T., & Bossert, S. T. (1995). Leadership as an organizational quality. *Education Administration Quarterly*, 31(2), 224-243.
- Ogawa, R. T., & Hart, A. W. (1985). The effect of principals on the instructional performance of schools. *The Journal of Educational Administration*, 23(1), 59-72.
- Organisation for Economic Co-operation and Development. (2008). *Improving school leadership: Policy and practice*. Paris: OECD.
- Organisation for Economic Co-operation and Development. (2010). PISA 2009 Results: Executive Summary
- Peddie, R. (1992). *Beyond the norm? An introduction to standards-based assessment. Developing a qualification framework for New Zealand*. Wellington: New Zealand Council for Educational Research.
- Post Primary Teachers' Association. (2008). *The NCEA: A pathway to the future*. Paper presented at the Post Primary Teachers' Association Annual Conference, Wellington.

- Robinson, V. M. J. (1998). Methodology and the research-practice gap. *Educational Researcher*, 27(1), 17-26.
- Robinson, V. M. J. (2008). Fit for purpose: An educationally relevant account of distributed leadership. In A. Harris (Ed.), *Distributed leadership: Different perspectives*. New York: Springer Publishing Company.
- Robinson, V. M. J., Hohepa, M., & Lloyd, C. (2009). *School leadership and student outcomes: Identifying what works and why*. Wellington: Ministry of Education.
- Robinson, V. M. J., Lloyd, C., & Rowe, K. J. (2008). The impact of leadership on student outcomes: An analysis of the differential effects of leadership types. *Education Administration Quarterly*, 44, 635-674.
- Rossmiller, R. A. (1992). The secondary school principal and teachers' quality of work life. *Educational Management Administration and Leadership*, 20(3), 132-146.
- Rowan, B., & Denk, C. E. (1984). Management succession, school socioeconomic context, and basic skills achievement. *American Educational Research Journal*, 21(3), 517-537.
- Rowan, B., Raudenbush, S. W., & Kang, S. J. (1991). Organizational design in high schools: A multilevel analysis. *American Journal of Education*, 99(2), 238-266.
- Rowe, K. J. (2004). *The importance of teaching: Ensuring better schooling by building teacher capacities that maximize the quality of teaching and learning provision – implications of findings from emerging international and Australian evidence-based research*. Paper presented at the Making Schools Better Conference: A Summit Conference on the Performance, Management and Funding of Australian Schools.
- Rutter, M., Maughan, B., Mortimore, P., & Ouston, J. (1979). *Fifteen thousand hours*. London: Open Books Publishing Limited.
- Salganik, L. H. (1994). Apples and apples: Comparing performance indicators for places with similar demographic characteristics. *Educational Evaluation and Policy Analysis*, 16, 125-140.
- Sammons, P. (1996). Complexities in the judgement of school effectiveness. *Educational Research and Evaluation*, 2(2), 113-149.
- Sammons, P., & Luyten, H. (2009). Editorial article for special issue on alternative methods for assessing school effects and schooling effects. *School Effectiveness and School Improvement*, 20(2), 133-143.
- Sammons, P., Thomas, S., & Mortimore, P. (1997). *Forging links: Effective schools and effective departments*. London: Paul Chapman Publishing.
- Schein, E. H. (2004). *Organizational Culture and Leadership* (3rd ed.). San Francisco, CA: Jossey-Bass.
- Schmoker, M. (2006). *Results Now*. Alexandria, Virginia: Association for Supervision and Curriculum Development (ASCD).
- Scott, D. (2008). *How does achievement at school effect achievement in tertiary education*. Wellington: Tertiary Sector Performance Analysis and Reporting, Ministry of Education.
- Shook, J. (2010). How to change a culture: Lessons from NUMMI. *MIT Sloan Management Review*, 51(2).
- Shulruf, B., Hattie, J., & Tumen, S. (2008). The predictability of enrolment and first year university results from secondary school performance: The New Zealand Certificate of Educational Achievement. *Studies in Higher Education*, 33(6), 685-698.
- Siskin, L. S. (1991). Departments as different worlds: Subject subcultures in secondary schools. *Educational Administration Quarterly*, 27(2, May), 134-160.
- Siskin, L. S. (1994). *Realms of knowledge: Academic departments in secondary schools*. London: The Falmer Press.
- Smith, W. F., & Andrews, R. L. (1989). *Instructional leadership: How principals make a difference*. Alexandria, Virginia: ASCD.

- Steiger, J. H., & Lind, J. C. (1980). *Statistically based tests for the number of common factors*. Paper presented at the Psychometric Society Annual Meeting, Iowa.
- Strachan, J. (2001). *Assessment in change: Some reflections on the local and international background to the National Certificate of Educational Achievement (NCEA)*. Wellington: Victoria University of Wellington.
- Telford, M., & May, S. (2010). *PISA 2009: Our 21st century learners at age 15*. Wellington: Ministry of Education.
- Thomas, S., Peng, W. J., & Gray, J. (2007). Modelling patterns of improvement over time: Value added trends in English secondary school performance across ten cohorts. *Oxford Review of Education*, 33(3), 261-295.
- Thomas, S., Sammons, P., Mortimore, P., & Smees, R. (1997). Stability and consistency in secondary schools' effects on students GCSE outcomes over three years. *School Effectiveness and School Improvement*, 8(2), 169-197.
- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development*. Wellington: Ministry of Education.
- Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38, 1-10.
- van de Grift, W. (2009). Reliability and validity in measuring the value added of schools. *School Effectiveness and School Improvement*, 20(2), 269-285.
- Verona, G. S., & Young, J. W. (2001). *The influence of principal transformational leadership style on high school proficiency test results in New Jersey comprehensive and vocational-technical high schools*. Paper presented at the Annual Meeting of the American Education Research Association, Seattle.
- Vlaardingerbroek, B. (2006). Transition to tertiary study in New Zealand under the national qualifications Framework and "the ghost of 1888". *Journal of Further and Higher Education*, 30(1), 75-85.
- Wahlstrom, K. L., & Seashore Louis, K. (2008). How teachers experience principal leadership: The roles of professional community, trust, efficacy, and shared responsibility. *Education Administration Quarterly*, 44(4), 458-495.
- Weber, J. R. (1989). Leading the Instructional Program. In S. Smith & P. Piele (Eds.), *School Leadership: Handbook for Excellence*. Eugene, Oregon: ERIC Clearing House on Education Management.
- Weik, K. E. (1976). Education organization as loosely coupled systems. *Administrative Science Quarterly*, 21(21), 1-19.
- Wellisch, J. B., MacQueen, A. H., Carriere, R. A., & Duck, G. A. (1978). School management and organization in successful schools. *Sociology of Education*, 51(July), 211-226.
- Willms, J. D., & Kerckhoff, A. C. (1995). The challenge of developing new educational indicators. *Educational Evaluation and Policy Analysis*, 17(1), 113-131.
- Witziers, B., Bosker, R. J., & Kruger, M. L. (2003). Educational leadership and student achievement: The elusive search for an association. *Educational Administration Quarterly*, 39(3), 398-425.
- Wylie, C. (2007). What can New Zealand learn from Edmonton? Available from <http://www.nzcer.org.nz/pdfs/15845.pdf>
- Wylie, C. (2009). Getting more from self-management. In J. Langley (Ed.), *Tomorrow's Schools 20 years on* (pp. 135-146). Auckland: Cognition Institute.
- Wylie, C. (2010). *Principal vacancies and appointments 2008-9*. Wellington: New Zealand Council for Educational Research.
- Zhang, L., & Marsh, D. (2006). *How can we predict performance in tertiary level economics?* Paper presented at the New Zealand Agricultural and Resource Economics Society. Retrieved from <http://purl.umn.edu/31974>

