

More than just results!
Leadership actions for effective use of assessment
information

A thesis submitted in partial fulfilment
of the requirements for the degree of
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by Dean McKenzie

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Attestation of Authorship

I hereby declare that this submission is all my own work and that, to the very best of my knowledge and understanding, it contains no material previously published or written by another person, nor any material which has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

The research reported in this thesis has been approved by the University of Canterbury Educational Research Human Ethics Committee.

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Abstract

The New Zealand Ministry of Education expects secondary schools to make effective use of assessment information (Ministry of Education, 2011) to guide student learning and achievement. This expectation is not unique to New Zealand. The quest for more effective data use in schools has been growing in popularity throughout the globe. My study investigates how New Zealand secondary schools are responding to the challenge of using data from the New Zealand Certificate of Educational Achievement (NCEA) to shape their teaching and learning strategies.

A pragmatist paradigm is applied to my study. This includes a mixing of both qualitative and quantitative research methods including a national online survey and semi-structured interviews. This required a form of paradigmatic pluralism, a mixing of both qualitative and quantitative methods, achieved by engaging in an explanatory sequential mixed method research design. This approach enabled a broad view of the landscape of assessment information use across a wide range of New Zealand schools. This is then followed by a narrowing of focus to explore the process of assessment information use in greater detail by focussing on a small number of case study schools.

The findings reveal inconsistent use of NCEA assessment information and considerable frustration and dissatisfaction from school leaders and teachers. Challenges such as data literacy, the tension between accountability and professional development, and capacity to engage with NCEA assessment information are interrogated. The layers of leadership and the impact they have on NCEA assessment information use in New Zealand are also examined.

My study aids in expanding understanding of how the process of NCEA assessment use is complex and multifaceted. NCEA assessment information use is perhaps even more complex than the education sector is currently aware. Recommendations are presented to guide practice, including a model to assist school leaders in New Zealand make effective use of NCEA assessment information. This model is built upon the foundation of the DIKW hierarchy and uses data conversation protocols, along with a visual representation of the contributing factors, to show how NCEA assessment information can be transformed from data to actionable wisdom. Although my study is firmly rooted in a local context, the results have implications for the wider challenges that school leaders face in terms of expectations to leverage nationally collected data for enhancing student learning and achievement.

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Chapter 1: Introduction

1.1 Chapter Overview

My study investigates how New Zealand secondary school leaders are responding to the challenge of making *effective use* of national data for overall school improvement. The growing expectation that data be used to inform all school decision making processes means school leaders and teachers must be confident in their knowledge about what the data suggest warrants closer scrutiny and strategies for improvement (Bishop et al., 2010; Earl & Katz, 2006). Furthermore, there is agreement that using data throughout the school can have a positive effect upon improving the outcomes of learning and achievement, thereby creating a moral imperative for leaders and teachers to pay attention, learn about and engage with data (Alton-Lee, 2011; Kerr et al., 2006).

I begin this chapter with clarification of the concept of *data use* before moving on to establish the reason why this topic matters for those in the secondary school sector. Following from this I explain my own connection with the topic including my professional responsibilities to further data literacy in schools. The chapter concludes with my research questions and a brief overview of the remaining thesis chapters.

1.2 What is data use?

The term '*data use*' as used in my study, follows the definition of Jimerson and Wayman (2015) namely, "the actions in which educators engage as they collect, organize, analyse, and draw meaning from data in efforts to inform practice" (p. 3). A distinction is made between the term '*data use*' and '*effective data use*' to highlight the "benefit [for] educators in their practice" (p. 3). This terminology recognises the importance of seeing data use as *more than just results*, but instead embedded into reflective teaching practice, forming a cycle of inquiry to continually inform teaching actions. Data used amongst teachers can lead to overall school improvement (Brown et al., 2014). Throughout my study I refer to the term '*data use*', with the assumption that such use is about effective use.

The term '*data*', when used in an educational setting, also needs to be defined, because as Lai and Schildkamp (2013) explain, data can be conceptualised to encompass any information that is collected by schools. This means that data outside of the definition of assessment data may be included in a broader definition of the term, such as attendance data, demographic

data. All these data help to establish knowledge of the context to which assessment applies and thus be used to inform the improvement of practice.

I now turn to consider the topic of data use in contexts beyond New Zealand to show that this topic is of international interest and concern.

1.3 How does the international literature describe the situation of data use in schools?

Data use has been gaining popularity in educational reform across the globe (Datnow & Hubbard, 2016; Lai & McNaughton, 2016). This is particularly true in the USA since the No Child Left Behind Act of 2001 and the Every Student Succeeds Act of 2015 (Mandinach & Gummer, 2016). Elsewhere the term, data use, is prevalent in Australia, New Zealand, Canada and South Africa, among others (Schildkamp & Lai, 2012). In fact, advocates go as far as to say that *data use* is the “next major strategy to support instructional improvement and student achievement” (Marsh & Farrell, 2015, p. 270).

Although much has been written in recent years about the importance of data use, the field is still an emerging one (Mandinach & Gummer, 2015). Many authors and researchers support the conjecture that data use positively impacts on student achievement (Ebbeler et al., 2016; Kerr et al., 2006; Mandinach & Gummer, 2016; Wayman & Stringfield, 2006). Nevertheless, some researchers such as Carlson et al. (2011) lament what they think is a lack of definitive evidence about the impact of data use. For them, claims about the effectiveness of data use are more in the realm of conjecture than substantiated fact. Reinhorn et al. (2015) agree that there is ample evidence about the value of using data to make “decisions about the status of schools and teachers”, however suggest there is far less evidence about “how educators within schools are using data to inform decisions that are closely tied to everyday student learning” (p. 2).

We know something about obstacles and impacts of data use because they feature in the body of international research literature, yet what is lacking is a strong foundation for understanding how data use practically happens in schools (Reinhorn et al., 2015). Research is needed to follow the flow of data through a school right up to its impact on teachers’ reflective decision making. There is also work to be done helping leaders determine appropriate actions to take to establish effective use of data in their schools. Having briefly considered the international context, I now consider data use from the perspective of the New Zealand context.

1.4 What is the situation in New Zealand regarding data use?

New Zealand schools are facing similar pressures and issues to other countries in making more effective use of data. Scholars have found that the effectiveness of school leaders in New Zealand at embedding data use throughout their schools, is variable (Absolum et al., 2009; Dyson, 2021; Robinson et al., 2002). Picking up on this variability, the Education Review Office (2014)¹, has confirmed that only 25% of the schools they investigated had analysed and responded well to their summative assessment data. What ERO found more concerning, was that 35% of schools had carried out a considerable amount of student analysis but had yet “to see any clear benefits from the time they had invested” (p. 1). This finding was more than a resourcing matter and raised questions about the effectiveness of school’s processes and methods of utilising data.

Concern about effective data use is not new. A few years earlier Absolum et al. (2009), recognised a need to increase the effectiveness of data use in schools. They identified several components to this work naming a need for an alignment of strategies, access to exemplars displaying a range of examples of best practice, and finally encouraging researchers to help communicate their findings about data use for the “implications for professional learning to be pursued” (p. 42).

There has been some work done in this area in New Zealand towards understanding the place that assessment has in teaching and learning. This is highlighted by the clarity around this message given by the Ministry of Education in the curriculum document and their position paper on assessment (Ministry of Education, 2007, 2011). Regardless, there is still work remaining to help school leaders establish effective use of data in their schools. Absolum et al. (2009) call for a sharing of practice and experiences of data use in schools from across the sector to support school leaders in their role.

Absolum et al. (2009) claim there is an obligation amongst scholars to engage in research in the field of data use to get the message about data heard throughout the teaching profession. They argue for the importance of dissemination and access to knowledge about methods and approaches that have shown to be successful in implementing the effective use of data. This

¹ (ERO - the government organisation with responsibility for monitoring and evaluating the integrity of the New Zealand education system)

implies that the contribution of research studies can inform practice, by revealing options and providing reflective tools that educators can utilise.

I now turn to my personal interest in the topic and the emerging field of research relating to effective data use in schools. My interest relates to my leadership position in a New Zealand secondary school and the roles and responsibilities that are associated with this position.

1.5 What is my personal interest in the topic?

Upon being appointed assistant principal of a secondary school, I was given, amongst other tasks, the portfolio of data analysis, with the mandate to improve the use of data throughout the school. It was assumed that with my knowledge of mathematics this portfolio would naturally fit within my skillset. In undertaking my role, I soon discovered many obstacles that had to be overcome. These obstacles are explained in order to establish my concern about how to deepen knowledge about data beyond just me. In explaining my personal interest, I focus on the challenges I experienced in my work and how some of the research literature helped me understand the nature of source of the frustrations I was experiencing.

The first, and probably greatest challenge I faced was the mistrust and misunderstanding of the place of assessment information by all stakeholders, from the local school board through to the classroom teacher. Data were viewed purely for the purpose of accountability and not as a prompt for personal reflection on the knowledge to be gained from examining the data. Such viewpoints highlighted a tension between summative data use (accountability through use of trend and comparative data) and formative or effective data use (for overall school improvement). My concern was in line with what Datnow and Wohlstetter (2007) found in relation to tensions between different purposes for data use. These authors support intentional work to re-educate staff, by engaging with teachers' beliefs on the impact and influence that data could have, when used in a reflective sense. Similarly concerned with the development of school culture in relation to data use, Timperley and Alton-Lee (2008) recommend staff development time be devoted to uncovering teachers' existing theories about data use before improvements are planned. They also argue teachers' existing theories must be considered in that staff development time otherwise little progress will be made.

As the senior leader tasked with the responsibility of data use at my employing school, my knowledge of assessment alone has been insufficient to make a shift in knowledge and application of effective data use across the school. What I lacked was knowledge of leadership for learning principles to engage teachers in maximising their use of data. In

particular, I needed to work in a non-threatening way for the benefits of engaging with the data to be realised by teachers. This became apparent to me through my personal experience and was reinforced through my professional reading delving into educational leadership for learning/school improvement. Once staff saw the potential for data to be useful for improvement, finding a way forward in implementing school wide data use was much easier. This reinforces what Wayman and Stringfield (2006) have likewise found, namely that successful implementation of data use occurs when leaders are “able to help teachers use data rather than be used by data” (p. 569).

The next obstacle I faced was how to develop methods and processes for analysing and disseminating national data. Exemplars, descriptions of common practice, or guidelines were sparse. Discussion with colleagues in a similar role across a wide range of schools established that I was not alone in seeking how to implement effective data use. This issue of lack of clarity and guidance echoes what Absolum et al. (2009) found to be the state of assessment in New Zealand and led them to make their call for a sharing of methods and approaches.

Flockton (2012) reaffirmed this when referring to these recommendations of Absolum, by stating:

Unless this advice is followed [a sharing of methods and approaches], there can be little confidence of achieving the needed momentum towards the realisation of improvements in assessment practice that will significantly benefit both teaching and learning (p. 146).

Absolum et al. (2009) have taken this notion of ideas for using data further, by suggesting the Ministry of Education should “support the provision of efficient computerised reporting systems that allow timely access to assessment information, aggregated or disaggregated depending on need” (p. 41). This, Absolum et al. (2009) argued, would enable a greater coordination across schools and a greater awareness of available evidence, interpretation and feedback relating to assessment information.

To date there seems to have been little progress made in this area. This coupled with personal experience and challenges in working in the area, stimulated my choice of topic for a doctoral study. I welcomed an opportunity to gather and analyse data that would contribute to research in this emerging field, beyond my own professional practice and disseminate knowledge and strategies for using data effectively. Whilst there is some informal sharing of strategies, a doctoral study affords more visible and formal methods of dissemination, albeit in academia and residing in a university library. Questions I asked myself were, ‘are there any efficiencies

that could be established and proven methods or process that could be duplicated?’ If these do exist and are not too firmly embedded in context, my study will be one means of making a difference beyond my own school, following Absolum et al.'s (2009) plea for improvement in the ways data are managed and shared across school sites.

I now move to present a critical incident that exemplifies the difficulties involved in data use if a school does not have effective systems and processes firmly in place.

1.6 Critical incident

The incident that follows is informed by my own personal experience and what senior leaders from other schools have suggested is a possible consequence of poor management of an assessment use process. I include it at the outset of my study as a way to illustrate the responsibility of schools to work with their summative data yet for a formative purpose for ongoing improvements. I return to this incident in the final chapter relating it to the findings from my national survey and interviews with school leaders. I preface the incident with an explanation of the responsibilities of those who work with the summative data provided by NCEA results to schools.

In New Zealand at the beginning of the year, department heads write a report to senior leaders describing a review of the previous year’s student achievement. The senior leader then collates all these reports and creates a summary which is then presented to the local school board. I have personally been made aware of situations where misinterpretations have occurred within this process, leading to unfortunate consequences.

One incident that illustrates the challenges to be navigated involves a report written by a department head, with sound statistical knowledge, reporting to a senior leader who lacked this knowledge. Within a school the expectations of what is to be reported on may not be prescribed giving department heads a certain degree of autonomy as to the content of their reports. There may not be any system in place where the initial departmental reports are discussed between the department head and the senior leader. Indeed, such discussions may be viewed as a time-consuming process for which a senior leader may not have the capacity to undertake.

This kind of issue arises when the department head has assumed the interpretation of the information being presented is self-explanatory requiring no further analysis at the school level. A senior leader and the department head may draw differing conclusions from the same

data.

Reports to the school boards can name an underperforming department and recommend a review of a department. Reports to the board may not be routinely shared with the department heads providing no opportunity to uncover misinterpretations of data. The department head may only become aware of the board report once the review has been initiated.

It is hoped my study will identify possible systems and processes that would help to avoid the type of critical incident described above. Data use throughout a school is a complex process and can be viewed through many roles and contexts. Therefore, it is important to clarify at this opening stage the context situating this study.

1.7 What is the context of data use?

My study primarily focuses on aspects of leadership related to the use of summative assessment information in a formative sense in New Zealand schools. In a New Zealand secondary school setting, one of the parameters of success is the awarding of a national qualification, in the case of most schools this is a New Zealand Certificate of Educational Achievement (NCEA) level certification. As this is a major measure of student academic achievement, it is important to utilise the rich information and knowledge this data can provide, to enhance professional practice. This data set provides the context for my leadership role and responsibility.

NCEA data are a culmination of secondary school level high stakes assessments, as prescribed by the Ministry of Education. Students, normally in years 11, 12 and 13, engage in national assessments both internal (school administered) and external (governing body administered). The resulting NCEA data is a collation of all these assessment results, gathered by the New Zealand Qualifications Authority (NZQA). These data are then shared with schools who are tasked with making effective use of them. With the amount and type of NCEA related data now freely available to New Zealand schools and the mantra of data driven decision making widespread, the question remains, how are New Zealand secondary schools making use of this to inform their decision making and to ultimately work towards school improvement?

My study is based on the assumption that leadership and learning are connected (Hallinger, 2011; Robinson et al., 2009). Therefore, my focus is about how school leaders and the school as an organisation, respond to NCEA assessment information use. This in no way minimises

the importance of other stakeholders related to the phenomenon in question, such as students, teachers, parents, the school governance board. All these stakeholders can engage in leadership work but are beyond the scope of this study. The inclusion of these additional voices was initially considered, but time constraints and the manageability of the project led to the decision to focus more on leadership and the actions taken by formal school leaders regarding the use of NCEA assessment information.

This concentration on leadership is reflected in my research questions which are presented next.

1.8 What are my research questions?

The overarching question guiding my research is:

To what extent and in what ways do secondary schools use NCEA assessment information to improve learning and achievement?

There are two main aspects that the research will focus on: deliberate leadership actions; and challenges and obstacles. These govern the formation of the sub-questions linked to the main research question.

Sub question 1: What are the challenges that school leaders encounter in gaining insight into NCEA assessment information?

Sub question 2: What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

The overall structure of this study is now presented.

1.9 Structure of the study

There are six chapters contained in this study including this first introductory chapter. They are organised as follows:

Chapter 1 establishes relevance and interest in the topic, locates the research in an emerging field, and presents the research questions.

Chapter 2 examines the literature to see what has previously been studied and what is already known and documented in the field. This chapter expands on ideas introduced in Chapter 1. The chapter begins with an exploration of how authors describe the concept of data literacy. An examination of the topic of data use in schools follows, paying particular attention to the

tension between conflicting agendas. Finally, data use in schools is considered through a leadership lens.

Chapter 3 justifies the selected research paradigm of pragmatism. The chapter continues with an examination of the links between this paradigm and the methodology chosen to undertake the research being a mixed methods methodology. After explaining my justification for choosing my preferred methodology, I describe the two methods which form the two phases of my study.

Chapter 4 presents the analysis and findings relating to a national online survey. This relates to the quantitative element of my mixed methods research. The perspectives of school leaders across a wide range of schools, on the topic of data use, are collated specifically through understandings of summative assessment data. The results highlight the level of importance schools place upon the use of NCEA assessment data but also expose conflicting purposes underlying this importance, leading at times to unintended consequences.

Chapter 5 presents analysis and findings relating to case study and the additional qualitative elements of my mixed methods research. It examines the process of NCEA assessment information use in schools in greater depth focussing upon three key players: the principal, a senior leader, and a middle leader in three separate individual schools. Semi-structured interviews are carried out and analysed to gain understanding of the educators' perceptions of data use in their respective schools.

Chapter 6 seeks to employ a mixing of methods and methodologies to analyse and summarise some the key themes of this study. The literature is called upon in this chapter to ground the discussion of my study alongside scholarly writing and research about data use in schools. Recommendations are then presented and a new framework to help understand the concepts of NCEA assessment information use in schools is proposed.

Chapter 2: Data Literacy, Data Use and Leadership

2.1 Chapter Overview

The focus of this chapter is to review the literature, critically examine and synthesize what is known and what has been researched about the topic of data use in schools. I identify and indicate where further research is warranted. These research and scholarly literature provide a foundation upon which I build my own study.

A synthesis of the literature has uncovered a recurring theme of agreement regarding the purpose and outcome of data use in school. There is a clear acceptance for data use for overall school improvement (Lai et al., 2014; Poortman et al., 2016; Van Geel et al., 2016).

Nevertheless, how to ensure data use is maximised is another matter. The structures and processes involved are complex, leading to challenges and obstacles to be overcome to successfully implement effective data use (Sebestyén, 2021). This leads to an area that requires further investigation, namely, how schools are working to implement data use.

I now turn to the organisation of the chapter. This chapter is organised into three sections. Each section begins by identifying what body of literature has been considered and clarifies and justifies what literature is not considered. The first section begins by exploring the concept of data literacy, which is interrogated from both an organisational and individual point of view. This provides a broader view of the overall topic of data use. With a narrowing of focus, the second section of the review moves on to consider what authors have said about data use in schools. This draws upon both empirical and theoretical work from across the world, before looking more closely at the context of New Zealand schools.

The third and remaining section considers data use through a leadership lens. A leadership lens is adopted in recognition of the long-standing evidence that school leadership makes a difference to student improvement (Hallinger, 2011; Leithwood & Hopkins, 2020). This section considers why leadership is important before linking leadership to data use in schools.

The chapter concludes by summarising where scholars have put their energies, what they describe as challenging, and where in the body of literature my study may enhance understanding of the field.

I have chosen to phrase my topic headings in this chapter as questions. I now turn to my first question about what constitutes data literacy and explore the knowledge and skills necessary to understand data.

2.2 What is data literacy?

In the literature the terms *data use* and *data literacy* are often used interchangeably so it is important to establish how these concepts will be distinguished in my study. *Data use* focusses on the practical application of data in specific contexts, while *data literacy* refers to a broader set of skills and knowledge that underpins effective data use. I now explain how I navigated the literature and the search terms employed.

2.2.1 What choices were made in selecting the literature on data literacy?

Research and scholarly writing that specifically mentioned the term *data literacy* in their titles were the articles initially referenced in the scoping of research for this section. Of note were Gummer and Mandinach whose work focused on data literacy from 2008 - 2016. Their work has received frequent citation by others. In fact, Henderson and Corry (2021) consider their articles as *foundational literature* on the topic of *data literacy*.

Next, I explored literature for the key words *data use*. *Data use* is a general term used to describe how data informs decision making impacting upon professional practice. In the literature, both New Zealand and international, *data use* is referred to in many different ways. e.g. Data-Driven Decision Making (Schildkamp, 2019), Evidence-Based Practice (McKnight & Morgan, 2022), Data Informed Decision Making (Fernandes, 2021), Data Based Decision Making (Mandinach & Schildkamp, 2021). The use of these terms in the field of education, according to Young et al. (2018), is interchangeable.

The differences in terminology are largely a matter of semantics with considerable overlap among the two different concepts. There are, however, subtle differences that reflect their origin and purpose. An example of this is Evidence-Based Practice. It is characterized by the utilization of objective, externally sourced, and predominantly quantitative evidence to inform teachers' pedagogy. This methodology is explicitly derived from medicine and has been promoted as a medical approach to education (McKnight & Morgan, 2022).

In New Zealand there is evidence of all these terms being applied to *data use* in schools, although in policy documents the Ministry of Education favours the term “evidence based” (Ministry of Education, 2011). Dyson (2021), in her study of school self-evaluation in New Zealand secondary schools, claims that the processes of using data “are typically referred to as data-driven decision making, or more recently, data-based decision making or “*data use*”” (p. 111). My literature search also combined these terms in multiple ways. One example was data combined with decision making.

At the heart of these terms is the same purpose that *data use* should “inform the pedagogical decisions in planning for and enacting learning” (McKnight & Morgan, 2022, p. 2). The literature on *data use* spans the business community through to any large organisation that collects data. For this review I have limited the organisational context to those in the education sector. Some additional, broader literature has been used sparingly and only when examining some of the detailed processes of *data use* throughout an organisation resulting in decision making.

Now that the keyword searches have been explained I address the meaning and importance of *data literacy*.

2.2.2 How does the literature define data literacy?

Henderson and Corry (2021) undertook a literature review of educational articles from 2010 to 2018 to gain a better understanding of *data literacy* research. They found that initial definitions of the term lacked “any mention of action based on the data” or “a direct connection for using data to inform instruction” (p. 234). Indeed, they claimed “even though there is an increased consensus on the terms and definitions, a common academic vocabulary around *data literacy* skills and knowledge is still evolving in the field” (p. 235). They attributed this lack of common terminology as a reason why the development of educators’ skillsets continues to be deficient.

The definition of *data literacy* that Henderson and Corry (2021) adopted builds on the earlier work of Gummer and Mandinach (2015), who interpreted *data literacy* “as the collection, examination, analysis, and interpretation of data to inform some sort of decision in an educational setting” (p. 2). Gummer and Mandinach (2015) went further to refine this by stating:

We define data literacy for teaching as follows: Data literacy for teaching is the ability to transform information into actionable instructional knowledge and practices by collecting, analysing, and interpreting all types of data (assessment, school climate, behavioural, snapshot, longitudinal, moment-to-moment, and so on) to help determine instructional steps. It combines an understanding of data with standards, disciplinary knowledge and practices, curricular knowledge, pedagogical content knowledge, and an understanding of how children learn (p. 2).

In simpler terms, *data literacy* refers to the knowledge and skills required to understand and use data effectively. I now turn to why the topic of *data literacy* is important and how *data literacy* fits within the scope of my study.

2.2.3 Why is data literacy important?

If schools are expected to make good use of data, the assumption at the outset is that *data literacy* exists, from the institutional level right through to the individual teacher. Earl and Katz (2006) claim *data literacy* as one of the biggest challenges schools faces when engaging in *data use*. They suggest addressing *data literacy* before trying to improve *data use*, arguing that what is needed is a greater understanding of the skills and knowledge required to be data literate.

The focus of my study is on NCEA summative data collected from national assessments as an endpoint of learning for students. Data are summative since they are derived from final assessments of students' learning that is used for certification purposes such as National Qualifications. NCEA assessments include high stakes internal and external (examination) assessments. These data are then handed to schools to unpack and gain understanding and form processes of using them. The data being considered in this research are part of national data sets. Teachers and school leaders are expected to understand and use data that comes from these large national data sets. The purpose of my study is to examine the skills and knowledge necessary for schools to be able to use this information formatively to inform teaching and address the gap between national data dissemination and teachers' use of data to inform next teaching steps.

There is a distinction between national level statistics, which can show country wide trends, and the role for each school interpreting these data and taking meaning for their individual situations. This distinction is important to note because the purposes for these data differ (between nationally reported data to summarise broad trends as opposed to data that are disaggregated and provided to schools for them to use). Summative assessment sources can be used formatively in school contexts to inform teaching and learning. It is up to the schools themselves to make value judgements of the knowledge available to be gleaned from the data. However, what is in doubt is the level of data literacy present in schools to undertake this task.

Next, I present the processes involved with *data literacy*, beginning with the conceptual frameworks put forward by authors that help to further understand the topic.

2.2.4 How does the literature use frameworks to help understand data literacy?

There are many ways in which the components of *data literacy* may be organised, subdivided, and traced from an organisational, to department level, through to the actions of

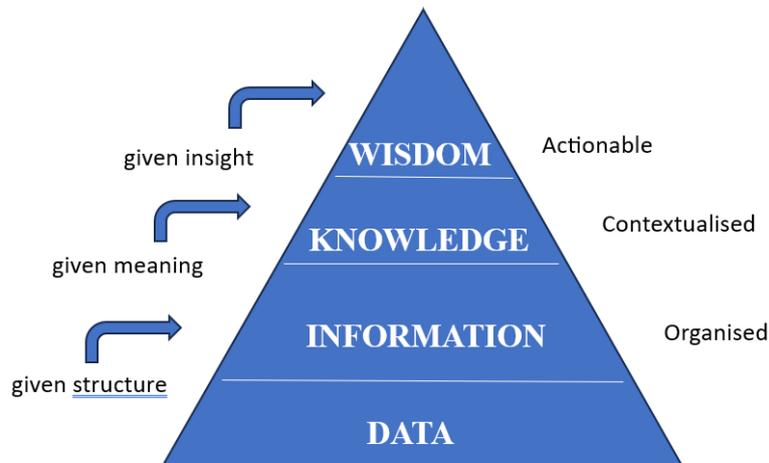
individual teachers according to the literature. What scholars have become increasingly aware of is the need to recognise the scope of the complex relationships and interactions that make up data literacy.

To help describe this process scholars have tended to rely on conceptual frameworks, which Gummer and Mandinach (2015) argue are imperative to help guide the understanding of data literacy. These frameworks can guide processes that organisations can pursue in engagement with data. They can also guide what individuals might do, and different elements they need to have skills with to be individually data literate.

Frameworks are useful for understanding *data literacy* because they employ powerful visual representations of the interconnectedness of the process involved in an organisation using data. The terms and descriptions used also help describe the steps of transformation required before raw data can have a meaningful effect on decision making. There are many possibilities for frameworks to make sense of the *data literacy* to *data use* issue, from the simplistic through to extremely complicated and detailed.

Taking heed of the work of Gummer and Mandinach (2015) I have chosen to employ a framework to help guide my exploration of the term *data literacy*. The chosen framework is the “*Data to Information to Knowledge to Wisdom*”, also sometimes called the knowledge (information) pyramid, or as more commonly referred to, the DIKW hierarchy (Aven, 2013). Many scholars spanning the fields of education and business have used this term DIKW as a starting point to explain the levels of transformation of data to achieve data literacy. As such it has also formed the basis of other frameworks as it is able to reduce the complex processes involved with data literacy into one visual representation. This framework borrows from management theory and organisational psychology and sociology to help describe the processes of data literacy (Light et al., 2004). The reason for drawing upon the DIKW framework is because it acknowledges the steps required to use data in ways that enable it to be the evidence prompting actions for improvements to practice.

Figure 1 DIKW framework



Note: The DIKW framework adapted from “The Knowledge Pyramid: the DIKW hierarchy” by M. Frické, (2019), *Ko Knowledge organization*, 46(1), p. 33.

Visually this model is a pyramid (sometimes a triangle as shown in the figure above) split horizontally into four even sections. The term ‘data’ forms the larger base with the remaining three narrowing slices containing the terms information, knowledge and finally wisdom on the top of the pyramid. The framework illustrates three stages of transformation that data undergo to become actionable inside an organisation. It distinguishes between data, information, and knowledge. The framework describes the transformation by defining information as data given context. This is where the data itself has been organised into a state, (through forms of analysis), where it can be interpreted. Taking this information and giving it meaning creates knowledge. Finally, knowledge gained by applying insight, leads to actionable wisdom.

The major limitation of this framework is related to its greatest advantage, its simplicity. There are limited details about what constitutes specific actions under each step, however, using this framework enables greater freedom to explore these actions through different ways as described in the literature.

I now narrow the focus to examine how scholars have explained the process of taking data to understanding, within the broader understanding of data literacy. For the section subheadings I utilise the DIKW framework to describe the transformation of data. Much of the literature in this section focuses on institutional needs and school decision making. The lens applied is

from a school leader's perspective recognising that school leaders are central to the data literacy of an organisation.

2.3 How is data literacy achieved?

The skills and knowledge necessary to achieve data literacy are not straight forward. In fact, scholars argue that for schools having the data present is not sufficient in itself. This is because there is no guarantee that information can be gleaned from it (Datnow & Kennedy-Lewis, 2012; Herman & Gribbons, 2001; Wayman, 2005). Earl and Katz (2006) suggest there is a need to establish systems for organisational data literacy so that data can be processed, organized, structured, and then understood in context. In this section I unpack some of the key concepts that scholars have suggested warrant attention, as data flows throughout a school. I begin by exploring the questions that scholars suggest need to be addressed for data to be successfully transformed to information and for challenges to be highlighted.

2.3.1 How are data transformed to information?

Several authors address the first action step of the *DIKW* framework and operationalise it for the use of data at the school level (Mason, 2002; Kerr et al., 2006; Lachat & Smith, 2005). Mason (2002) points out, "data do not magically appear, ready-made, to provide evidence of success and to solve all of the school's problems" (p. 6). She further contends there is a big gap between having data and transforming this into information that is useful for decision making. These are challenges to be overcome.

The process of turning data to information is seeking to answer three distinct, yet related questions.

How will the data be managed?

How will the data be analysed?

How will the data be presented?

The following sections address each of the questions separately.

How are data managed?

Up-front planning for data management and analysis is often a step overlooked, particularly by policy makers. Kerr et al. (2006) argue that successfully using data into school decision making also needs planning for the distribution of necessary resources for data management. Mason (2002) came up with several searching questions to be answered when planning for data use, namely:

Who will undertake data entry and data maintenance?

How will the issues of confidentiality be addressed?

Where will the data be kept, in what database and how will it be accessed?

Who will import it into the appropriate software for analysis?

What technical capacity will need to be developed?

These questions do not just require answers initially but according to Mason (2002), are continuously used to inform the use of data. The constant focus on these questions ensures schools successfully build data use into their decision making operations. Therefore, systems are continually developed and reviewed to prevent disruption of this flow of data.

In most schools data generally exist in an electronic format stored somewhere in the school's data management system. In many cases data are stored in such a way that teachers and school leaders may not have sufficient access to the data or the ability to provide the necessary contextual details in order to transform it to the information they would need. This, according to Lachat and Smith (2005), compromises the examination of how students in particular subjects or streams are performing and ascertain the effects of program changes and development on student performance as they progress over time. Dyson (2021) similarly noted such difficulties when researching New Zealand schools.

One way that schools can overcome this issue is by using data-warehousing applications in order to increase their ease of access. A *data warehouse* is a relational database that is designed for query and analysis rather than for day-to-day processing. As it is a separate entity and is not involved in the day-to-day organisational needs of a school, it can be specifically designed to be easily interrogated. It also has the advantage of being able to include data from various sources. Wayman et al. (2004) recommend that schools move toward data-warehousing to support the ability to interrogate and use data. This would enable schools to create far greater amounts of information easily from which knowledge could be gained. Likewise, Lachat and Smith (2005) support this notion saying many researchers such as Rudner and Boston (2003) have been advocates for increasing the importance of more advanced data-system technology. However, while there are professional organisations available to help schools make the most of data, Whitehead et al. (2013) note the prohibitive upfront costs. Having the data available is just the first step, it then needs to be analysed. I now turn to how scholars describe what is meant by the process of the analysis of data.

How are data to be analysed?

For data to be able to be transformed into information, scholars maintain data must firstly be cleaned, revised, downloaded into software for analysis, and formatted into the most appropriate format ready for reporting displays. Data must then be disaggregated so that true meaning and context can reveal patterns, trends and other important information for each school to analyse. Typically, student achievement data are reported as whole school data or year level data, in other words as aggregate data. Disaggregated data means looking at achievement data by classifying it into specific subgroups of students. The ability to achieve this level of aggregation is dependent upon schools having access to the appropriate technology. This obvious reliance on technology echoes the ideas put forth by Mandinach et al. (2006) who argue technology is an important component of their conceptual framework.

Lachat and Smith (2005) also demonstrated how teachers who took ownership when data were disaggregated, saw it as their data. This meant that they could see the relevance of the data to their own specific questions and so could begin to make instructional decisions in a more meaningful way.

This action highlights an important initial question posed by Lai and Schildkamp (2013), which is to ask why data have been collected and analysed in the first place? As Lai and Schildkamp (2013) contend, “without a clear purpose, it is easy to collect a lot of data that are not useful for decision making” (p. 16). Robinson et al. (2002) agree, purporting many schools waste a lot of time and resources collecting and analysing data which are then rarely used for decision making. The question of who owns the data is a further challenge that needs to be overcome when it is collected and analysed by others. Teachers need to understand and connect to the data for it to be used to guide future actions for enhancements to practice.

When analysing data, the ways in which they are displayed are crucial. Authors, such as Dickson (2005), state it is best to try and create models for data visualization that are designed to simplify and better represent the meaning in order to promote discussion. Further, Dickson recommends careful thought be given to what kinds of data and what kinds of data displays will allow for deepening discussions and informing decisions. Otherwise, the entire data gathering operation may expend a great deal of energy but for minimally actual impact (Dickson, 2005). As Tufte and Graves-Morris (1983) emphasized, the ways data are displayed govern the informational value of the data. Likewise, Dickson (2005) suggested teachers and school leaders benefit from displays that were easily available and clearly

showed the level of detail required for specific stakeholder discussions. In New Zealand the type of displays related to NCEA assessment information available for school leaders are shown in Appendices A and B.

Dickson (2005) went on to describe two data design principles influencing the impact and appropriateness of displays. Displays should firstly include a meaningful view of contrast between indicators and secondly should make clear the comparison of results with those of a reference group, such as nationally available data. He further claims that examples of effective data displays are those that promote reflection and raise different kinds of questions that can be further interrogated.

Herman and Gribbons (2001) in their work with schools found several basic principles that data representation should follow in order to improve their accessibility and understanding. They observed that displays needed to be simple, intuitive, and self-explanatory with any unnecessary detail removed. Bar graphs, pie charts and line graphs with plain backgrounds were shown to be good examples. However, graphs requiring more statistical interpretation, proved to be best avoided. The use of colour for communicating key ideas was established as being more effective in differentiating dimensions than shading or cross-hatching. They recommended the shading of a single colour, maintaining it could be useful for emphasising the idea of a continuum. Herman and Gribbons (2001) also claimed that teachers tended to engage more readily with visually appealing displays. They also concluded that displays with consistency in both design and the way in which colour were employed, enabled the overall picture to be more quickly grasped.

Once data have been analysed, the next step is transforming it from mere information to useful knowledge (Mason, 2002). This moves to the heart of data literacy. The processes that need to be in place for this transformation to occur are now presented.

2.3.2 *How is information transformed into knowledge?*

The terms '*information*' and '*knowledge*' are often used interchangeably. This blurring of definition according to the literature has led to misguided policies related to data, based on the understanding that these two terms are one and the same. However, as Spillane and Miele (2007) point out, there is a difference between evidence (*knowledge*) and *information*, and policymakers need to become more aware of this. This confusion of meaning is in part responsible for some of the issues that arise, as "policymakers often work on the assumption that evidence-based practice should be a simple and straightforward process for school

practitioners” (Spillane & Miele, 2007, p. 3). Often ignored is the fact that having *information* available does not necessarily imply *knowledge* has been gained. This is a recurring theme throughout the literature.

Earl and Katz (2006) define the transformation of *information* to *knowledge* saying, “information becomes knowledge when it is shaped, organised, and embedded in a context that gives it meaning and connectedness” (p.15). *Information* can only be turned into *knowledge* if school leaders and teachers are willing to engage with it and give it meaning. There is a real danger in using data without true context or really understanding its meaning. As Heritage and Yeagley (2005) put it, “relying on data alone, without the wisdom of experience and the caution of thoughtfulness, can lead to disaster” (p.333).

Successful use of data for school improvement hinges on emphasizing structured methods for discussing data (Kerr et al., 2006). Well-constructed conversations can facilitate the creation of meaning from information from a cyclical process involving questioning, interpreting and reviewing (Earl & Timperley, 2009). Therefore, knowledge building can be developed through professional discussions. The important factors necessary to achieve effective data discussions according to the literature are now presented.

What are the important factors for engaging in effective data discussions?

Dempster (2012) has referred to knowledge building, through structured professional discussions, as “*disciplined dialogue*” (p. 51). Disciplined dialogue is akin to an analytical process of describing the transformations, as data moves from providing information through to knowledge. As mentioned earlier, the terms information and knowledge are often confused. Disciplined dialogue as described by Dempster (2012), helps the distinction of information and knowledge, by relating the transformation of data to directed questions. That is to say; data to information, “*What are we seeing in this data?*”, giving it context; information to knowledge, “*Why are we seeing what we are?*”, giving it meaning; and finally, knowledge to wisdom, “*What, if anything, should we be doing about it?*”, giving it actionable insight. This is a sensemaking process and leads to the determination of whether there is a need to act.

Edwards et al. (2022) termed this process of using questioning prompts to guide professional discussions as employing a data conversation protocol (DCP). This utilised a stepwise prompt structure from assessment for learning literature to scaffold discussions. Edwards et al. (2022) found this to be “an effective and efficient way of supporting teachers to collaboratively

analyse and act on data aggregated at the level of individual, small group, class, school, and across school” (p. 14). Edwards et al.’s (2022) data conversation protocol focussed on specific prompts to help guide a teacher’s ability to effectively use assessment information. Edwards et al.’s (2022) protocol began with the prompt “here’s what?”, looking at the nature and source of the data being examined. Leading into the next prompt “so what?”, encouraging teachers to consider the reasons behind the information. The next prompt “now what?” is intended to help teacher plan interventions. The final prompt “so then” guides teachers to reflect on the results of their interventions and starting the cycle of inquiry over again.

The importance of open to learning conversations is emphasized by a number of authors. Moore (2014) discusses engaging in *open to learning conversations* in terms of collaboration and emphasizes them to be “highly dependent upon collegiality” (p. 54). He has also suggested that although teachers show a preference for informal conversations, the evidence of changes to their practice has been “thin compared to more highly structured, protocol-driven examinations of disaggregated cluster scores from standardized assessments” (p. 54). This reinforces the need to engage in more formal, structured open to learning conversations for there to be an impact on learning and achievement.

Michaud (2015), when investigating teacher learning in a data team, established that professional open to learning conversations impacted “on collective teacher efficacy, and overall nature of their own learning process” (p. 57). He highlighted the importance of two factors for the effectiveness of open to learning conversations. The first of these factors is shared goals and understanding. With any discussion related to achievement data, he claimed a need for a shared understanding and purpose within the parties involved about the meeting process and the conversations. Just as importantly, he continued, are the pedagogy and vocabulary to be used in the interpretation.

The next factor Michaud (2015) outlined refers to the regularity of the conversations. He argues that as open to learning conversations become more frequent, the potential for teachers to ignore negative trends or to over inflate the interpretation of achievement soon becomes self-defeating. This, he claims, is because teachers would not be able to continue with an unrealistic level of interpretation over time. So, for the use of achievement data to be effective, schools must regularly and systematically review through open to learning conversations. This enables historical tracking to cover and see the impact of programme change, and targets to be set and measured.

Timperley (2004) has specified the importance of five conditions for professional learning discussions. There is close alignment with Michaud's factors, particularly with conditions one and two, shared understanding and regular review. However, Timperley suggests an additional three, namely:

(1) *High teacher self-efficacy* - Teachers need to believe that the data they use has a clear purpose to make a difference to students and how they as teachers can help their learning.

(2) *Being realistic in the interpretation* - The potential for teachers to ignore negative trends or to over inflate the interpretation of achievement soon becomes obviously ultimately self-defeating. This is because they would not be able to continue with that level over time which leads into the next condition.

(3) *Identifying benchmarks* - The setting of benchmarks is essential in interpreting student achievement information. This gives both a starting point and a reference point to direct conversations and to keep them purposeful. As Hattie (2005) puts it "articulating a common language of progression" (p.14)

Michaud (2015) argues that building all these capacities, both systematic and personal, are essential for the successful implementation of a school culture that embraces data for data driven decision making.

The final aspect of the process of data use in schools is for the knowledge gained to impact on school improvement.

How is knowledge transformed into action?

This last and very important step had a surprising lack of authors addressing it directly, other than to describe it as Earl and Katz (2006) do, as an iterative process requiring constant evaluation of the information provided on student achievement in order to adjust teaching practice. However, the actual implementation of the actions or the type of specific actions undertaken seem to be missing in the literature. It seemed that scholars typically concentrated upon the nature of the conditions necessary for effective data use. This fits with Dyson (2021) and her claim: "the field (data use) is a relatively new area of scholarship that remains undertheorized" (p. 109). Mausethagen et al. (2018) provide a possible explanation for this gap saying scholars in the past have assumed that if teachers are provided with data, development will therefore take place.

Now that the process of *data literacy* has been explored, it is important to consider how schools are making use of data. I narrow the focus of the literature review to consider the operationalisation of data use in schools by identifying what the research literature says about *data use* in schools and the challenges schools experience when implementing data use for school improvement.

2.4 What are some of the challenges schools face in terms of data use?

This section reports on the research into how schools are using data and the challenges that they are encountering. The structure of this section begins with the choice of literature before moving on to identify specific challenges that scholars have expressed as having an impact on *data use* in schools. I then relate these challenges to work featuring the New Zealand context.

2.4.1 What choices were made in selecting the literature on data use in schools?

The same terms are used as reference points namely: data use, Data-Driven Decision Making (Schildkamp, 2019), Evidence-Based Practice (McKnight & Morgan, 2022), Data Informed Decision Making (Fernandes, 2021), Data Based Decision Making (Mandinach & Schildkamp, 2021).

In reference to New Zealand schools, additional operational literature in the form of policy documents is also drawn upon, as they help to frame the context of the work. These documents set the requirements and expectations of the official policy for NZ schools. They serve to enable and constrain the actions of school leaders in relation to data use.

The review begins with the most prominent issue that the literature describes as a challenge for schools in implementing data use for overall school improvement. This is the continual tension between accountability pressures and the need for professional learning and development to achieve improvement in school outcomes.

2.4.2 How does the use of data for accountability purposes affect data use in schools?

According to scholars the policies and practices surrounding the use of data typically have a mixture of two underlying, if not explicit, motivations, namely: for overall school improvement and for outcome-based accountability.

Hargreaves et al. (2013), termed the duality of purpose of data use as data-driven improvement and accountability noting these purposes are often in direct conflict with each other. The prevailing sense from policy makers appears to be that accountability in an educational forum leads directly to improvement in outcomes. However, this is not always the

case. As Hargreaves et al. (2013) state, “improvement efforts and outcomes-based accountability can work at cross-purposes, resulting in distraction from core purposes”(p. i). Therefore, it is important to identify where possible, “factors and forces [that] can lead data-driven improvement and accountability to generate more positive and fewer negative outcomes in relation to both improvement and accountability” (p. i).

In many areas of education, the use of data has become synonymous with accountability (Mandinach & Schildkamp, 2021). Since data have become more freely available, more and more pressure is being put on schools to give evidence of progress embedded with the language of data (Fullan, 1999; Hargreaves et al., 2013). The political motivations for the use of data are driven by the desire for increased professional accountability.

The New Zealand curriculum (2007) is clear about the expectations the Ministry of Education has as to how schools should be employing the use of data. The curriculum states,

Schools need to know what impact their programmes are having on student learning. An important way of getting this information is by collecting and analysing school-wide assessment data. Schools can then use this information as the basis for changes to policies or programmes or changes to teaching practices as well as for reporting to the board of trustees, parents, and the Ministry of Education (p. 40).

Although this acknowledges the fact that data can be used to reflect on teaching practice, in reality the importance of reporting to the various stakeholders has tended to overshadow this aspect. As Kerr et al. (2006) argue, when data are placed in the context of external accountability it adds little to the discussion and reflection of teacher practice and is therefore often deemed to be irrelevant to the classroom teacher. As Hattie (2005) states,

it is not uncommon for systems then to invent ‘accountability’ systems to drive the teachers to get more and more learning out of their charges. One form of accountability assumes that if only we could name, shame, and blame with evidence, we could get those teachers operating at higher levels of efficiency. Another form of accountability assumes that if only we could collect sufficient system-wide evidence, we could convince the parents/voters not to be critics. Both miss the mark (p. 2).

Firestone et al. (1998), explored the impact of performance-based assessment on teaching in the context of both moderate and low stakes assessments in the United States. They claimed for schools where accountability policies dominated, work was created at the principal and school leader level, but with often little compulsion for teachers to use data to reflect and inform their pedagogies. The upshot then, they suggest, is that data are used more for holding schools to account rather than using it for decision making and reflective practice about future

learning actions. This is an issue, as Linn (2000) points out, when high stakes accountability is the driving force behind data use, often unforeseen effects negate the intended positive effects.

An example of such effects is when assessment information goes so far as reaching the public domain, for things such as league tables. Many schools and teachers find it to be a frustratingly unpleasant experience (Brown, 2008). This is not due to the reluctance of transparency on the part of schools, but rather the uninformed manner in which it is commonly done. This creates feelings of negativity towards data by the very educators that could make valuable use of it for school improvement.

Moore (2014), in his comparative case study of three New Jersey High Schools in the United States, sums up the situation succinctly in suggesting: “external accountability’s use of data represents a rubber mallet upon the kneecap of a school’s political reflexes” (p. 14). Therefore, the inherent benefits of data use for more than just accountability must be made explicit and clear for the successful implementation of *effective use* for school improvement.

2.4.3 What are some of the benefits of data use beyond accountability?

Implementing a whole school approach to data use is a daunting task and if it was purely due to political pressure alone it would not gain much traction in schools. This points to the existence of other strongly held views that through the use of data, school leaders can foster continuous school improvement (Thornton et al., 2007). Likewise, this leads to the argument put forward by Honig and Venkateswaran (2012), the utilization of data presents a challenge not only within the existing accountability frameworks but across all school levels.

Researchers, especially in dedicated data driven decision making initiatives, demonstrate that the use of data yields favorable outcomes for the school.

Case studies crafted to investigate best practices have described schools in which the careful use of data has led to improved student achievement (Timperley & Philips, 2003). Timperley (2004) in her literature review stated “teachers who examined their student achievement information within a professional community were likely to have higher student achievement” (p. 1). Wayman (2005) also portrays a body of literature supporting the notion that applying data use to decision making can have positive results towards school improvement.

Coburn and Turner (2012) in their review of the research into how individuals interpret and make meaning of data, argue that understanding the role that data use can have in schools is extremely important, as it can not only help understand the measures of success but also provide insight into what conditions leads towards school improvement and just as importantly when it does not. The imperative for data use to be embedded into reflective teaching practice needs to be emphasized to teachers, as research shows data used in this context amongst teachers can lead to raised student achievement, the underlying goal of all schools (Brown et al., 2014; Carlson et al., 2011; Lai & McNaughton, 2016; Schildkamp et al., 2017).

The benefits of data use over and above accountability are clear as is the need for schools to engage fully in its implementation. This does not mean that accountability is to be fully ignored with regards to data use, merely that accountability must be acknowledged as having the potential to negatively impact on using data for overall school improvement.

The next challenge to be overcome is increasing the staff's ability to effectively engage with data. This description of the skills and knowledge to engage with data is referred to as *data literacy*. According to Sebestyén (2021), in his literature review of affective factors that influence data-driven decision making, data literacy is the next most affective aspect influencing data use after efficacy. In his review, he was referring to the individual's, rather than the institution's, ability to use data. Although these concepts are related, this ambiguity in the term's definition may cause confusion. For my study I will refer to the skills and abilities an individual requires for successful data use as *individual data literacy*.

2.4.4 How does individual data literacy affect school's data use?

One way of thinking about data literacy is to focus on organisations and levels of literacy within organisations. Becoming a data literate organisation is a complex undertaking, requiring iterative and interpretive processes to be followed in order to set and measure goals (Mandinach & Schildkamp, 2021). Here there is a distinction between a data literate organisation (an organisational view of data literacy concentrating on the overall systems and structure), and individual data literacy (the skills and knowledge an individual needs to make meaning from data). There is significant overlap between these two definitions and much of the discussion can easily be applied to either, by simply changing the perspective being taken.

Moving away from the broader data literacy for an institution, the focus now shifts to considering an individual's skills and knowledge necessary for data literacy. Earl and Katz

(2006) describe five aspects that someone who is individually data literate should have, these are:

(1) To be able to identify the purpose of the data.

To simply look at data without a purpose in mind will inevitably lead to disappointment and frustration. As Wu (2009) in her study of school leaders in California put it, “is like a car spinning its wheels and not moving forward” (p. 10). She concludes that teachers must first have a purpose in order to gather and collect the best sources of data needed to fulfil for that purpose. It is why posing a question or looking for solutions to a problem is often a good starting point. Lachat et al. (2006), leaning on the learnings from their case study of urban high schools carried out in Rhode Island, United States, rate the use of starting with investigative questions as one of the most important practices in individual data literacy. Lachat and Smith (2005) from that same case study, found that teachers who started with essential questions increased in confidence as they were able to look at data with a clearer purpose.

(2) To have the ability to recognize sound and unsound data.

This is a crucial step when considering many types and forms of data used for decision making as many times data are based on overall averages and there is always the possibility of human error creeping into analyses.

(3) To possess basic knowledge about statistical and measurement concepts.

This is one of the capacities that concerns educators the most as there is often a lack of confidence in, and dislike of, statistics. However, as Herman and Gribbons (2001), in their inquiry carried out across Southern California High Schools, state, teachers do not need to become experts in statistics or data analytics, but rather require targeted professional development to develop basic skills in statistical methodology, evaluation and data representation. The people tasked with the job of turning data into information require greater knowledge, however the knowledge makers of the information require far less; being involved in the interpretation stage of the process only.

(4) To focus on the meaning and interpretation.

Information only turns to knowledge when it is interrogated for meaning and implications for practice are established. At this stage of the process having a set structure to refer to helps deepen learning conversations (Datnow & Wohlstetter, 2007). This would involve looking for patterns and trends and then trying to discover underlying causes to enable not just explanation but to develop targeted action where required.

(5) To pay attention to the final stakeholders who require the knowledge from the information.

Wu (2009) states that this final characteristic is of greatest importance to school leaders. This is when data use is based in the traditional role of accountability, however, for the greatest impact on school improvement the ultimate consumers of this knowledge must be the teachers. For it is they who have the greatest chance to impact upon student achievement. This is where the flow of knowledge gained from data must permeate throughout the entire school structure to be effective.

Increasing the human capacity in this area of individual data literacy has frequently been noted by scholars as a barrier to implementing data use in schools. Supovitz and Klein (2003), in their study of innovative schools across the United States, reported concerns regarding the technical proficiency of teachers persisted, even within schools recognized as innovative data users. Indeed, few teachers and school leaders in the schools they looked at felt that they had the required skills to analyse data to answer the questions about which they were interested. Mason (2002), in her study into the efficacy of using an electronic information system to support continuous school improvement and school reform across six Milwaukee Schools in the United States, found schools consistently recognised their own deficiencies in skills and capacity and even after engaging in some targeted professional development still felt they lacked the necessary capacity.

This points to teachers and school leaders needing to become confident users of data (individually data literate). This according to Katz et al. (2002) requires a set of skills and mindset that encompasses an understanding of the nature of evidence spanning its definition, collection, interpretation and presentation. Datnow and Kennedy-Lewis (2012) claim that individual data literacy is important as teachers need to know how to analyse, interpret, and use data before they can make informed decisions about how to improve student achievement.

Other than these two main factors, accountability and individual data literacy, the literature does not describe in detail any other challenges, except briefly in passing. This was surprising given the emphasis in policy on schools using data, but fits with what Sebestyén (2021) found when he concluded the “literature review also showed how little DDDM-related affective factors have been researched, even though the knowledge of DDDM can help expand its application in the education field” (p. 28). This gives rise to the main thrust of this thesis, to

give voice to New Zealand educators as to the affective factors towards data use that they have been experiencing.

The review now turns to consider the situation in New Zealand schools in relation to data use.

2.5 What is the state of data use in New Zealand?

This section is informed in part by operational literature, not research literature. It is included here amongst the review of literature to help frame the context of data use in New Zealand.

What follows is an explanation of the state of data use in New Zealand, taking a critical, analytical view of two key governmental documents related to use of data.

In New Zealand, the effective use of assessment information to improve learning and achievement has been a focus for the Ministry of Education, spanning at least the last few decades. This has culminated into the information on assessment provided in the New Zealand Curriculum (Ministry of Education, 2007) and the Ministry's position paper on assessment (Ministry of Education, 2011). The Ministry of Education position paper built upon the key principles of a review of New Zealand's approach to assessment. This review was carried out by Absolum et al. (2009), and documented in the report, Directions for Assessment in New Zealand (the DANZ report). In this position paper the Ministry maintains,

It is generally recognised that the most important school-based influence on successful student outcomes is quality teaching. Effective assessment is a key component of quality teaching when it is used as a learning process to inform teaching and learning and improve student learning (p. 7).

The production of these two key documents has led to greater clarity about the need and value of using assessment data to inform learning, but not clarity on how to achieve it.

The progress made in New Zealand will now be considered with the two documents of the New Zealand Curriculum (Ministry of Education, 2007) and the Ministry's position paper on assessment (Ministry of Education, 2011) forming the basis for this discussion. Other government initiatives that have impacted on the effective use of data will also be mentioned.

The New Zealand Curriculum (Ministry of Education, 2007) has helped clarify the field of effective data use, by defining six characteristics of effective assessment, these being: benefit for students; involvement of students; supporting teaching and learning goals; planning and communication; fit for purpose; and is valid and fair. The document then moves from discussing assessment in general terms, to the particular importance of school wide assessment stating:

schools need to know what impact their programmes are having on student learning. An important way of getting this information is by collecting and analysing school-wide assessment data. Schools can then use this information as the basis for changes to policies or programmes or changes to teaching practices as well as for reporting to the board of trustees, parents, and the Ministry of Education. Assessment information may also be used to compare the relative achievement of different groups of students or to compare the achievement of the school's students against national standards (p.40).

This makes explicit the expectation the Ministry has of using school wide assessment data to improve learning and achievement. The Ministry's position paper on assessment (Ministry of Education, 2011) generalises the above statement by giving a broader theme to underpin the vision the Ministry has of effective assessment in a learning system. Namely:

all participants have a shared understanding of the role assessment plays in learning and are able and willing to both learn from, and contribute to, the process through effective participation within, and between, learning communities (p. 3).

Two aspects concerning participation, critical to the success of creating the conditions for learning, are outlined in the position paper. First, "the extent to which those who have information to contribute are encouraged to contribute and feel that their input is valued" and secondly, "how information is collected, interpreted, and used and the extent to which those who contribute information feel that their input is valued". (p. 21). The input being referred to here in this sense, is the contribution to the understanding and interpretation of assessment information. The doubling up of the statement "their input is valued" highlights the Ministry's strong desire to actively encourage the engagement of all stakeholders, teachers, middle leaders, senior leaders and community, involved in the learning journey and to emphasize the need for them to play a part. The emphasis is on effective assessment, that contributes to improved student outcomes.

The majority of the text in the Ministry's position paper on assessment (Ministry of Education, 2011) describes the relationships throughout the learning system and the culture that needs to be in place in order to support such relationships. The goal the Ministry has is to create a learning community which is transparent and built around a high trust environment. This mirrors what the research, (as mentioned earlier in the review), suggests is necessary to create conditions for learning appropriate for establish a learning-oriented culture.

There has been better articulation of what is meant by assessment and its uses in New Zealand through the Ministry sharing the vision they have of what effective assessment looks like, "using data to inform teaching and learning" (p. 15). Further progress has been made by

the Ministry clearly articulating conditions for learning required to improve learning and achievement through effective assessment. In addition to this the New Zealand curriculum provided a framework to help structure both the focusing inquiry and the learning inquiry. The dilemma being faced though is that assessment can be used for different purposes for example supporting learning and accountability. This begs a question of which aspect does the policy emphasize? The answer is both formative and summative. The Ministry states an “assessment capable system is an accountable system” while at the same time extolling the virtues of a learning system. These differing agendas highlight the complexity and tension that exists within the use of data.

The Ministry concludes that to be seen as “assessment capable”, school leaders and teachers need to display not just assessment ability, but the capacity to plan improvements to practice as well. This is since assessment, the Ministry explains, “cannot take place outside the teaching/learning process – it is integral to it” (p. 26). This emphasises the importance the Ministry places on effective assessment.

Assessment has been the focus of the Ministry for decades. In the 1990s it was the Assessment for Better Learning program (ABLE) (Peddie, 2000), followed by the ATOL program of the early to mid-2000s (Poskitt & Taylor, 2008). Most recently it has been the Ministry of Education Student Management System (SMS) workshops, managed by CORE Education, entitled “Making the most of data”. The intention of all these initiatives, the Ministry explains in its position paper, is to promote the substantive change in practice needed for the schooling system to imbed effective use of assessment data. The Ministry states that it is committed to “building assessment capability and an understanding of the importance of evidenced based decision making” (Ministry of Education, 2011, p. 23). Another major contribution in the field of assessment in New Zealand has been the creation of the New Zealand Assessment Institute (NZAI), (Poskitt, 2018). This institute is an initiative of Associate Professor Jenny Poskitt from Massey University and Michael Absolum, Director of Evaluation Associates. The primary focus of this organisation is to foster collaboration about assessment matters throughout the educational landscape.

I now move on to the final section heading in the literature review,

2.5.1 What is the work remaining to be done?

The review of literature and Government policy documents suggests that there are several things that need to be addressed within schools to support effective use of data. These relate

to the development of positive school culture and creating conditions for learning, and capacity building of teachers, middle school leaders in addition to senior leaders.

In general, the difficulty with the directives from the governmental departments, is they do not address the school culture development and capacity-building activities that may enable teachers and school leaders to use data effectively. Simply having data available and a framework to work towards is expected to lead to improved practice and most often simply does not (Datnow & Kennedy-Lewis, 2012; Herman & Gribbons, 2001; Wayman, 2005). There are leadership actions that need to occur simultaneously. This push to use evidence is based upon the assumption that school leaders have sufficient individual data literacy themselves to make effective use of the information to be gleaned from the data (Hattie, 2005; Wu, 2009). However, school leaders lack time and the necessary expertise to utilise data and data analysis tools effectively and these are some of the most discouraging challenges to the successful implementation of data-driven decision making in schools (Kerr et al., 2006; Moore, 2014).

School leaders are becoming overwhelmed with this glut of information such that they are having to come up with policies and procedures, not just for analysis and interpretation, but for data management as well (Abshire, 2014). Though schools today may be using assessment data more frequently and extensively, case studies of schools endeavouring to engage in data driven decision making reveal that implementation does not always meet with success, pointing to other factors which may need to be considered. Now the challenge for schools is to move beyond analysing results and using summative data for the narrow scope of benchmarking success, towards making effective use of this data for the improvement of learning and achievement (Earl & Katz, 2006).

Creating conditions for learning, appropriate for effective data use, relies on getting teachers to move beyond seeing data as merely for accountability. This is inherently difficult, due to teachers' historical experiences with assessment data. Data, in the sense of basic achievement information, have been around in education for a long time and used for evaluation of success. Historically errors were considered unacceptable, and admission of a mistake regarded as a weakness (Earl & Katz, 2006). Data in this context could be "punitive or rewarding but not particularly helpful" (Earl & Katz, 2006, p. 4). Many educators when faced with the use of data in relation to their own teaching "are ambivalent at best and downright skeptical at worst" (Earl & Katz, 2006, p. 4).

So, the approach towards data use must be considered in order to enable teachers to see the benefits and to encourage them to use evidence to inform their own teaching. Moore (2014) considers the qualifiers of “careful” and “proper” should always be associated with the application of data use. This draws attention to the purpose of data use, about which policy makers, school leaders and teachers may have different ideas. There is potential disagreement over what might be ‘careful’ or ‘proper’ data use, depending on who makes the decision - whether individuals decide what data are valuable and how these might be used to improve their teaching, or school leaders using data to require teachers to make changes to teaching and learning. Also, merely trying to make use of data without considering the conditions for learning such as school culture, as well as teacher and school leader data literacy, may not be sufficient to improve learning and achievement. School culture and conditions may influence how open or sceptical teachers are about the use of data to improve learning.

The Ministry of Education does concede “it will require a high trust and collegial environment” (p. 8). However, this cannot coexist inside a culture of competition and accountability (Hattie, 2005). As Absolum et al. (2009) claim, it is important for teachers to be able to “analyse student assessment data without the anxiety that their findings might be used as evidence against them” (p. 25). Absolum et al. (2009) explore the issue of accountability further by stating:

It is often argued that there is a fundamental incompatibility between serving the purposes of learning and serving the purposes of accountability. The ‘formative’ and ‘summative’ labels have often become banners for this argument. The fact is that, for learning to be optimised, all those in a position of influence need to address both, usually simultaneously, without forgetting that the learning purpose is paramount (p. 32).

Changing a school’s culture and attitude towards data is possible to do, but first school leaders themselves must model this, as it is these leaders who can influence a school’s culture (Kerr et al., 2006). As Kerr et al. (2006) note, school leaders are key players in the effective use of data. The problem, however, is many school leaders often do not have adequate training in understanding, analysing, and interpreting data and, thus, it is challenging for them to empower their teachers to do so (Wu, 2009). In the Ministry’s position paper deliberate use of the term “*willingness*”, in the context of working together collaboratively as a learning community, seems to imply that there is existing an atmosphere of reluctance present. However, as Absolum et al. (2009) point out “there is a substantial unmet need for assessment professional learning for both teachers and leaders” (p. 26).

A more comprehensive strategy needs to be developed that deals with the underlying issue of individual data literacy in order for the Ministry to successfully enact their vision. This relates to increasing capability within schools. Caution is recommended by Flockton (2012) who argues “What this means in policy and practice may be a stretch for most — both stakeholders (including the students and their families) and educationalists alike (including other academics with expertise in assessment)” (p. 147).

This highlights the need for the Ministry to take a more prominent role to ensure greater consistency and more timely access to professional learning around individual data literacy. As Absolum et al. (2009) note, “capacity needs to be increased so that schools can access programmes when they need them” (p. 27). Having system wide improvement in the effective use of data is only possible though if “participants are willing to share their experiences of what works and doesn’t work and learn from each other” (p. 23). This sharing cannot be left to individuals if it is to gain momentum. It is here the Ministry and researchers have roles to play in ensuring the widespread dissemination of innovative practice.

The perspective taken in my study of data use is through the lens of school leaders and their actions. The literature is now again turned to in order to gain some understanding of how authors suggest mitigating these affective factors.

2.6 What is the role of school leaders in data use?

The leaders in a school are responsible for collating evidence of school improvement. This means leaders need to have a connection with learning and measures of student achievement. They are tasked to work with others to gain the necessary insights and to lead institutional change as a result of knowledge gained through the use of data. It is therefore necessary to examine the literature on leadership to provide a leadership lens on its connection with how to operationalise data use at the local level of the school and what leaders can do to enable effective data use in schools.

2.6.1 What choices were made in selecting the leadership literature on data use in schools?

Leadership is a broad topic and despite restricting the search terms to educational leadership, the field is still vast. The term leadership is often used to describe the group of individuals with overall organisational responsibility. The aspect of leadership which is being examined for this study focuses on the relationship between leadership and school improvement which

according to Hallinger (2011), defines the field of leadership for learning and recognises the uniqueness of workplace contexts in what is possible.

This review does not seek to engage with the discourse between transformational, instructional, distributed, shared or other leadership models. Instead, I have opted for leadership for learning, which Hallinger (2011) describes as “a broader conceptualization that incorporates both a wider range of leadership sources as well as additional foci for action” (p.126).

Literature was examined that related to data use, and its acronyms that specifically referenced the aspect of leadership. Here the leadership research studied is leadership to enhance effective data use.

2.6.2 Why is leadership important to consider?

Research throughout multiple countries point to the conclusion that school leaders’ actions provide critical support for data use in schools (Jimerson et al., 2021). The usefulness of data use for school improvement, Alton-Lee (2011) argues, is inevitably linked to the role that school leaders play in creating and sustaining the conditions for outcome focussed professional learning in schools.

Leithwood and Hopkins (2008), in their major literature review entitled, ‘Seven strong claims about successful school leadership’, propose that “School leadership is second only to classroom teaching as an influence on pupils” (p. 27). The same authors revisited these claims in 2020 and produced a new set of ten claims about successful school leadership stating:

School leadership has a significant effect on features of the school organization which positively influences the quality of teaching and learning. While moderate in size, this leadership effect is vital to the success of most school improvement efforts learning (p. 6).

Their claims emphasise the importance of leadership work in relation to data use as yet another crucial component in overall school data literacy.

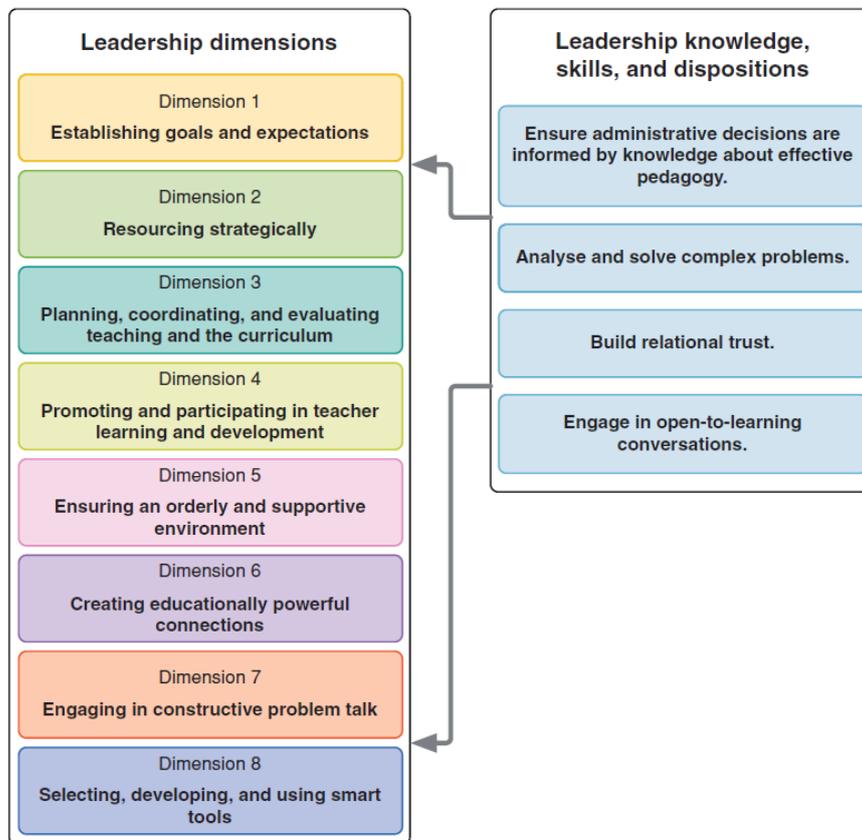
Hallinger (2011) stressed in his review of 40 years of leadership research the importance of context, both societal and institutional. This is particularly important in New Zealand since the Education Act of 1989 and the creation of the Tomorrow’s Schools reforms, giving the responsibility for the implementation of policy to local school boards. This has given schools the freedom to interpret, develop and implement the broader statutory policies (Wylie, 2012).

This is a further reason why case studies of individual schools and their leadership practices help us to appreciate the actions which help and hinder student learning.

Robinson et al's. (2009) work on the topic of the link between leadership and student outcomes, which formed part of the New Zealand Ministry of Education's Iterative Best Evidence Synthesis (BES) programme, identified leadership as having a positive impact on student outcomes. This work was preceded by an earlier paper by Robinson and Timperley (2007) which relied upon synthesizing 17 studies across New Zealand to form the core studies from which five important leadership dimensions were derived. There is a large volume of literature available on the topic of leadership for learning, however, Robinson et al's. (2009) work is included here as a way to acknowledge the large number of studies included and the familiarity of the New Zealand context by the authors.

Robinson et al. (2009) sought evidence of the relationship between leadership and student outcomes from three main sources; "assessments of the direct and indirect impacts of leadership on student outcomes, descriptive accounts of the role played by leadership in effective interventions into teaching and learning, and research on the links between leaders' knowledge, skills, and dispositions and student outcomes" (p.35). These sources came from 134 studies of which 61 were from New Zealand. The authors formulated eight dimensions of leadership and combined these with four aspects of skill and disposition from the empirical research studies they examined to show the positive link between leadership and student outcomes. These are shown in Figure 1 below.

Figure 2 *The knowledge, skills and dispositions underpinning the leadership dimensions*



Note: The knowledge, skills and dispositions underpinning the leadership dimensions taken from “School Leadership and student outcomes: Identifying what works and why” by Robinson et al. (2009), *Education Counts* p. 202.

Robinson et al. (2009) argue to move beyond a list of leadership characteristics that each of these dimensions above must be considered in their own context. These dimensions strongly resonate with how the literature has described the process for data use in schools and the implicit role that leaders must play. What follows next is a description of these dimensions, paying particular attention to the context of data use.

First dimension to be discussed is *establishing goals and expectations*. These must be related to the underlying purpose of improving student outcomes. It is through the unambiguous articulation of goals that leaders can demonstrate to staff the expectation of the priority of events and outcomes. Goals related to student outcomes must not only be measurable, but realistic, actionable, and achievable, for them to be realised. The power of establishing and maintaining goals is to counter the distractions of “multiple agendas and conflicting priorities,

dissipating the efforts and initiative of staff, leading potentially to burnout, cynicism, and disengagement” (p. 202). Robinson et al. (2009) claim “without goals, there is no distraction to recognise, and routines and crises come to dominate leaders’ work” (p. 203). It is important to note that Robinson et al. (2009) make a clear distinction between goals and vision or mission, emphasizing the importance of “actionable activities” and “repeated cycles of data-based inquiry” involved in goal setting (p. 203), thus firmly embedding this dimension in terms of data use.

The second dimension of *strategic resourcing* is important in New Zealand where school leaders have a measure of discretion available to them as to how to manage their resources. Schools where students were performing well, were found by Robinson et al. (2009) to have staff reporting that the appropriate resources and support were available to them. The use of data requires specific resourcing allocated to the process and the decisions leaders make regarding this can have significant impact as to how effective data use is throughout a school. This resourcing goes beyond personnel and could include *the selection, development and use of smart tools* which is another important dimension of leadership.

The third dimension *evaluating teaching* is particularly relevant when considering the context of data use in schools. Schools where leaders took personal involvement in the evaluation of teaching were found to outperform those schools where leaders did not. The evaluation of teaching is inherently linked to data use as there needs to be a measure by which to assess levels of performance.

The fourth dimension of *promoting and participating in teacher learning and development* has a strong correlation with positive student outcomes. The willingness of school leaders to become professional learners themselves is necessary for the successful implementation of data use into a school culture, a matter also realised by Timperley (2004). Herman and Gribbons (2001) found that school leaders who can make effective use of data and were knowledgeable about it, not surprisingly had a strong vision for how to implement data use in their own schools.

Dimensions five and six of *ensuring an orderly and supportive environment* and *creating educationally powerful connections* relate more to the underlying aspects of curriculum and the conditions of its delivery. While these are important leadership dimensions, the context of

this study is focussed upon the use of summative assessment information, and in this sense, they only indirectly affect the use of data throughout a school.

The eighth and final dimension, *engaging in constructive problem talk*, is intrinsically connected to the leadership dispositions of building relational trust and the ability to engage in open to learning conversations. The ability to model and promote this is one of the most important aspects of effective data use in schools.

Robinson et al. (2009) concluded the extent to which leaders' work impacts upon school improvement is dependent on the ongoing development of skills and dispositions for effective data use. Another point that Robinson et al. (2009) raised was the need for specific leadership exemplars illustrating critical leadership tasks, echoing Absolum et al's. (2009) call for a greater sharing of professional practice.

Robinson (2011) has continued her work on student-centered leadership with further elaboration of these dimensions distilling the eight dimensions into five: quality enactment of goal-setting, strategic resourcing of those priority goals, ensuring the quality of teaching, leading teacher learning and development and finally, ensuring an orderly and safe environment. In essence the most recently formulated dimensions remain mostly the same, although some have been subsumed under other headings.

Leaders are both tasked with leading while simultaneously also being directly involved in the processes of institutional change. A consideration of change from the leadership perspective helps us to understand the key ideas that relate to data use and the leader's role and challenges, looking not just at the individual leader actions, but the context of the institutional (school) structures in which these actions are applied.

One of these institutional (school) structures that is deemed important for successful data literacy is the establishment of a learning culture to which I now draw attention.

2.6.3 *What is a learning culture?*

Earl and Katz (2006) argue that school leaders need to create an atmosphere where errors are seen as a normal part of the improvement process, and data and evidence are seen as merely opportunities for opening dialogue. They suggest an emphasis from school leaders' regarding the potential of data can help to mitigate the possible challenge of low buy-in by staff, particularly if it is non-threatening and used in positive ways.

Datnow and Wohlstetter (2007) argue data-driven decision requires a continual investment in the school culture related to data use. Scholars, such as Timperley (2004), identify the need to develop a learning culture as one action needed by leaders to ensure a supportive atmosphere for learning with relation to effective data use. According to Timperley (2004), this culture provides a necessary foundation from which open to learning conversations are possible.

Timperley's (2004) research using interviews with school leaders gathered their opinions about how to develop a learning-oriented culture through the sharing of assessment data. She highlighted two major themes of trust and benefit for schools to be considered learning oriented.

The first theme of *trust*, focused on the beliefs held by those involved in the process of data use around the purpose of how the data would be used. Timperley (2004) described the need for all involved to trust the data and for it to be seen as a learning activity and not a time to appropriate blame. It was argued that a collegial atmosphere needed to be developed where trust and mutual respect underpinned all discussions. Timperley (2004) noted that a collective sense of responsibility was also considered essential.

Timperley (2004) regarded the second theme of *benefit* as one of the reasons necessary for staff buy-in. The lack of accepted benefit, she argued, could be attributed to a reluctance to share and engage with achievement data. The amount of time and effort expended, needed to be reflected in positive outcomes for learning and achievement, thus contributing positively towards the school's overall improvement. In other words, data needed to be seen as having relevance to and impact on classroom practice.

When it comes to adult learning, agency, ownership and engagement only increase where the benefit for learning is explicit. With this comes higher levels of self-efficacy, which as Dunn et al. (2013) point out, leads to teachers being more willing to use data based practice. Kerr et al. (2006) found that these two themes of trust and benefit echo the most common issues that teachers themselves have with applying data to their teaching pedagogy.

Other actions that identified by authors that school leaders can take to positively influence data use in schools are now presented.

2.6.4 What leadership actions are required?

Through grappling with interpretation of data and constantly seeking deeper meaning, leaders are engaging in their own professional development. This, according to Robinson et al.

(2009), is the one dimension of school leadership dimensions studied, that has the greatest effect on learning and achievement. Herman and Gribbons (2001) reported that school leaders who can make effective use of data and are seen as knowledgeable about data, have a strong vision for how to implement effective data use in their own schools. Thus, the willingness of school leaders to become professional learners in and of themselves is necessary for the successful implementation of effective data use into a school learning culture (Timperley, 2004).

Relying solely on leaders alone to interpret and use data, is not the answer to increasing the awareness of data use throughout a school (Earl & Katz, 2002). Neither is placing all the leadership responsibility for effective data use into a designated person the path to follow. Wayman and Stringfield (2006), suggest the opposite reporting how the most successful school leaders were those able to serve as catalysts for initiating data inquiry, but then endeavored to establish a more distributed leadership in relation to data use. As Moore (2014) put forward, a leader can set the conditions for successful data use but ultimately a successful learning-oriented culture is co-constructed and shaped by its members. He continued to state:

Leaders may need to incentivize ownership and participation with the message that teachers are accountable to the common understandings that they all own and to which they all contribute. Distributed leadership in these efforts may allow teachers to take meaningful roles in enforcing those understandings and forge healthier systems of internal accountability (p. 96).

This concept of the importance of sharing leadership responsibilities is one dimension included in Dempster's (2012) model of leadership.

2.7 Conclusion

The literature in this review suggests that careful and proper use of data is likely to improve the quality of education and thus improve student achievement in schools. The ways in which to achieve these improvements requires foundational components to be present. These components relate to, creating the appropriate conditions for learning, that is; a learning orientated culture leading to open to learning conversations. When these components (both systematic and personal) are in place, and sufficient practical resourcing is given, then effective use of data does lead to improvements in learning and achievement (Absolum et al., 2009).

The potential for effective use of data to improve learning is a reason why the implementation of a school wide system of data use should be a priority in schools today. The challenges

involved in using data effectively and the costs involved in time and capacity, both technical and personal, should be considered by schools when making decisions about data use. The real challenge for schools is to develop robust processes for data management and analysis, data literacy and for creating a culture of inquiry that is sustainable. This is a sophisticated and continual process that builds competency over time and requires deliberate cultivation (Earl & Katz, 2006).

There has been work done in understanding the place that assessment has in teaching and learning. This is highlighted by the clarity around this message given by the Ministry of Education in the curriculum document and their position paper on assessment (Ministry of Education, 2007, 2011). However, there is still more work to be done, helping leaders determine appropriate actions to take in order to establish effective use of data in their schools. In particular, actions to combat the constant challenge between accountability and a learning culture, along with highlighted the specific professional development needs of leaders. To do this sharing of practice and experiences is called for (Absolum et al., 2009).

This highlights the importance of conducting research in this area of data use for school improvement. Schildkamp (2019) concludes

When it comes to using data to improve the quality of teaching and learning, it is evident that some of the most important enablers and barriers include data literacy and leadership. However, what is less well understood is how we can promote the enablers and remove the barriers to unlock, more fully, the potential of data use. Only then can data use lead to sustainable school improvement (p. 257).

Although much has been written in recent years about the importance of data use in schools, the field itself is still an emerging one (Mandinach & Gummer, 2015). The vast majority of the literature support the conjecture that data use has a positive impact on student achievement (Ebbeler et al., 2016; Kerr et al., 2006; Mandinach & Gummer, 2016; Wayman & Stringfield, 2006). However, some researchers' such as Carlson et al. (2011) still lament the lack of definitive evidence. Reinhorn et al. (2015) agree that while there is ample evidence about using data to make "decisions about the status of schools and teachers", "how educators within schools are using data to inform decisions that are closely tied to everyday student learning" (p. 2) is less visible.

This concern is still relevant today, as Dyson (2020) claims "secondary schools in New Zealand use assessment data for school self-evaluation, but little research has explored exactly how schools are using these data (p. 89). This gives the impetus for carrying out

my study, looking not just at the systems involved in making effective use of national assessment data for student learning, but gaining the perspectives of the senior school leaders who are engaged with the process. It is why the following chapters of this doctoral study are devoted to the experiences and views of senior school leaders as they navigate the challenge of using national assessments to inform future teaching and learning practices.

I now turn to the methodological decisions made as I planned my study design. I reveal the journey I undertook as I encountered the approaches of qualitative and quantitative research paradigms in my reading of methodological literatures. A discussion of my own views on knowledge and research are included, that have governed my methodological choices for my research into the leadership actions that help with effective use of data in New Zealand secondary schools.

Chapter 3: Methodology and Methods

3.1 Chapter Overview

In this chapter I present and justify the methodology and methods which underpin my study. I begin this chapter by exploring my own personal background and experience in research and describe how this has influenced my methodological position. I present how various authors explain the approaches of qualitative and quantitative research paradigms and outline my personal struggles with the very notion of paradigms themselves. Further discussion shows how I conclude that my actual philosophical position is one of *pragmatism*, which I have considered the most appropriate methodology alongside the nature of my research questions.

Next, I move to describe the underlying reasoning used when considering my methodological choice. Included is an explanation how undergoing reflection upon the underlying goals of my study has led me to the realisation that a mixed methods research methodology is the most appropriate to undertake. This discussion continues with a more in depth account of mixed method research designs showing how I have related it to my study by utilising the *explanatory sequential mixed methods research design* as described (McCrudden et al., 2019).

Following the discussion on methodology, I proceed to focus upon the chosen research methods. Two different methods were employed to gain data for my study. These were a national online survey and a descriptive multi case study which utilised interviews. The national online survey is presented first and includes an explanation of the concepts of total survey quality and total survey error. I then explain how these are applied to the survey design and implementation stages in my study, with reference to population identification and question design.

The chapter concludes with a description of the second method utilised for my study, the case study structure. I begin by introducing three other researchers who have undertaken study in the field of education and employed a case study approach. Each of their projects is considered in terms of their methodology, methods, and finally limitations. Reflecting upon these studies I then give my justification for choosing a *descriptive case study* method. I move to present the design of the case study including aspects of; case identification,

interview design and protocols, validity and reliability, my role as the researcher, limitations and conclude with the ethical considerations undertaken.

3.2 Methodology

3.2.1 Towards pragmatism

My methodological choices are based upon my own personal views and approaches towards knowledge and knowledge acquisition. I am at heart a mathematician and hold a Master's Degree in Mathematics. My view on research reflects my scientific background. The ontological position I have traditionally taken fits mostly with the standpoint of *realism*, that is to say, I believe knowledge is there to be discovered and hence is independent of the researcher. My feelings toward epistemology are one of *objectivism*, believing in the existence of an objective reality from which knowledge could be gained (Arthur et al., 2012). These beliefs sit firmly within the quantitative paradigm of positivism (Scotland, 2012). However, doing research in the social science field of education, and having my topic being heavily reliant on context and human interaction, I now acknowledge a need for a *relativistic* ontological position to embrace an epistemology of *subjectivism*. In this context I accept that reality has the possibility of being subjective and thus able to be constructed, thereby requiring the qualitative paradigm of *interpretivism* (Scotland, 2012). Hence, I have become torn between the supposedly opposing paradigms and left to wonder where my true theoretical position on research would fit, as I have come to appreciate the benefits of both approaches.

In the beginning of my journey into investigating my research question of “To what extent and in what ways do secondary schools use NCEA assessment information to improve learning and achievement?”, I was under the impression a quantitative study focussing on resources, technology and methods would help me gain the understanding that I was hoping to achieve. However, the more I studied the topic I realised that the human interactions, resulting from the information gleaned from the quantitative information, were of equal if not greater importance. Therefore, my initial decision was to undertake a *case study* approach. However, I still did not think of myself as fully embracing a purely qualitative paradigm.

The search for which methodological paradigm that would fit not only with my ontological and epistemological positions but with the nature of my research questions continued. My quest was to ensure my research was sound and cohesive academically. Such paradigmatic

reflection, as Marshall and Rossman (2014) argue, is necessary for epistemological integrity in research methodology. I found myself unable to sit wholly in either the qualitative or quantitative paradigms. I was aware of the historical tensions that existed between these two paradigms, but as Burton et al. (2008) mention, there are also overlaps between the *realist* and *interpretive* approaches as well, often leading to the combination of both qualitative and quantitative data in a study. This led to some hope that there indeed existed a paradigm which allowed for a combining of methodological viewpoints. This is what Onwuegbuzie (2012) has referred to as the *radical middle*. A sentiment similarly endorsed by Teddlie and Tashakkori (2003) who suggest “it is indeed possible to have two paradigms or two world views, mixed throughout a single research project” (p. 11).

3.2.2 *Mixed methods research and pragmatism*

Acknowledging that others (Marvasti, 2004; Mingers, 1997) have not adhered to a single research tradition, I considered whether a single or mixed paradigm would be the most appropriate option to gain the kind of information and insight I deemed necessary. I chose a mixed paradigm with the knowledge that this methodology was not without some controversy. Indeed, Denzin (2010) has coined the term paradigmatic wars, to capture complex arguments such as: quantitative and qualitative methods being fundamentally different and thus incompatible, and how paradigms themselves are incommensurable due to their ontological and epistemological differences.

These disagreements harbour around what Morgan (2007) has described as the metaphysical paradigm, one where there is an assumption of an existing connection between methodology, ontology and epistemology. This leads to the debate that methods themselves can fall under the purvey of a single paradigm (Greene & Hall, 2010). However, more recently, Onwuegbuzie (2012) suggests the level of intensity around the conflict pertaining to paradigms had significantly decreased in the research community when compared to historical levels. Maxwell (2016) found “little evidence of the paradigm conflicts” when looking at studies that combined both “qualitative/humanistic and quantitative/scientific approaches” (p. 19).

In the particular field of educational research, Clark (2019) has asserted that research based upon the mixing of methods has gained widespread acceptance and application. Furthermore, an argument has been developed supporting the combination of both qualitative and quantitative approaches in the same study or as Denzin (2010) stated, “a compatibility thesis

at the paradigm level” (p. 419). The term used by researchers to describe the overarching philosophy guiding this new paradigm, according to McCrudden et al. (2019), is *pragmatism*.

The definition of pragmatism, as outlined by Arthur et al. (2012), is a philosophical stance rejecting “the dichotomies of *realist vs. idealist* ontology and *subjective vs objective* epistemology” (p. 8). At the heart of pragmatism is the approach to “see the whole notion of paradigms as problematic and unhelpful” (Arthur et al., 2012, p. 8). The belief that all research must have the characteristic of only “one of a small number of paradigms” is an oversimplification according to Arthur et al. (2012). Clarke and Visser (2018) propose that pragmatism is the “most sensible and practical method available in order to answer a given research question” (p. 3). Moreover, there are others who suggest, “pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis in the mixed methods study” (Creswell & Creswell, 2017, p. 12). This has resonated strongly with me as I now see that the context being investigated should dictate the paradigm and not the other way around. For me the benefits of taking the pragmatic approach of what works for a given situation have particular appeal. This is why I now embrace *pragmatism* as my underlying philosophy to research.

I now turn to describe the reasoning underpinning my final methodological choice of *mixed methods research methodology*.

3.2.3 The choice of mixed methods research methodology

My journey to decide upon a methodology in which to frame my research has not been an easy one. It began with the formulation of my overarching research questions and from that deciding how to go about seeking the information I needed. To my surprise I did not find this to be a linear, sequential process. It was instead more organic, growing from a seed of curiosity, which then germinated into many different ideas and unexpected directions. As with any growth, throughout the research design process, pruning was required to focus and identify what is the most important issue driving the need for my study. At all times I returned to the nature of my research questions and found that they themselves led me to my methodological choice.

So now having gained reassurance from my reading of methodological author sources that a single methodological approach is not a requirement, I considered the project as a whole and realised there were two separate but related areas that I wished to investigate. Firstly, I

wanted to canvas views from across the secondary education sector to see if there were any commonly held beliefs or trends about data knowledge and use. Secondly, I wanted to look at some individual schools in far greater detail in order to gain a deeper understanding of the processes followed.

To achieve these stated goals, I realised that a *case study* approach in and of itself was insufficient. This meant that the research project needed two distinct and sequential phases of data collection and required a form of “paradigmatic pluralism”, a mixing of both qualitative and quantitative methods. While the literature had suggested that this was indeed possible (Clark, 2019; Onwuegbuzie, 2012), I still needed a methodological approach within which to frame my study.

The answer came in the form of a methodology whose development had been heavily influenced by pragmatism itself, namely *mixed methods research* methodology (McCrudden et al., 2019). This is research which is able to draw upon both quantitative and qualitative approaches in the same study (Tashakkori & Creswell, 2007). Although mixed methods research is sometimes referred to as the third paradigm, as Stockman (2015) argues, in doing so “perpetuates a paradigm debate which creates difference and invites positioning, rather than encourage a flexibility in research to optimise quality of the work” (p. 75). So, in this sense I am not choosing to define mixed methods research as a paradigm by itself, but as Johnson et al. (2001) argue, an unescapable necessity of engaging in research in the field of education whilst maintaining a position of pragmatism.

Therefore, I have chosen a mixed methods research methodology in which to undertake the study, reflecting my pragmatic approach and my desire not to take a solely qualitative or quantitative stance. This methodological *eclecticism* as Teddlie and Tashakkori (2012) term it, means I am able to “select and creatively integrate the most appropriate techniques from a wide variety of qualitative, quantitative, and mixed strategies in order to thoroughly investigate the phenomena of interest” (p. 776). Guetterman (2017) describes these as showing “reflective openness” and the ability to be deeply respectful, of ways of knowing that are other than his or her own, of data that come from sources other than the ones he or she prefers” (p. 388).

There are concerns using this method, however, especially when the researcher is a novice like myself (Stockman, 2015). This stems from the researcher in question needing to have the

minimum competency level required in both qualitative and quantitative methods to engage in a mixed method body of work (Shulha & Wilson, 2003). This was a serious consideration for my study, given my lack of experience with academic level qualitative research. Naturally given my mathematical background I was very comfortable with quantitative methods but my unfamiliarity with qualitative approaches needed to be confronted. This meant during the qualitative elements of the study I relied heavily on the expertise and guidance of my supervisors, who were well versed in qualitative methods. I also took heart that many dissertation writers were also embracing a mixed methods methodology successfully despite their inexperience (Schulenberg, 2007; Stockman, 2015).

Mixed methods research designs are now explored in greater depth, including definitions and reasoning involved in the final methodological choice.

3.2.4 Explanatory sequential mixed methods research design

In examining the literature for mixed methods research I was surprised by the range of research designs and terminology employed. As an inexperienced researcher I felt lost in a sea of what seemed to be conflicting definitions. I should not have been surprised though as Teddlie and Tashakkori (2012) state, “this is to be expected in a field that has formally existed for only 10 to 15 years, especially one that has always been characterized by diverse opinions” (p. 775). In the opening editorial of the first volume of the *Journal of Mixed Methods Research*, the editors Tashakkori and Cresswell discussed the inconsistencies they found in scholars’ definitions and conceptualizations of the terms. In particular, they drew attention to how authors considered the ways in which two or more different sub-studies related to each other.

The confusion seemed to lie between mixed methods as the joining of two different approaches to research and mixed methods referring to two separate types of data (*qualitative* and *quantitative*). Although similar, the first example is in reference to methodology whereas the second involves methods. In order to clarify how these possibly ambiguous terms apply to my study, my use of the term mixed methods research is in reference to methodology. I will partially adopt the definition of mixed methods research as put forward by Johnson et al. (2007) who examined definitions from multiple researchers, who they recognised as leaders in the field, before proposing the following definition based on their analysis of the underlying themes they observed:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (p. 123).

When undertaking mixed methods research it is important to quantify the degree to which mixing, or integration, is occurring. This can be considered as a continuum as shown in the table below.

Table 1 *Graphic of the Three Major Research Paradigms*

Qualitative Dominant		Pure Mixed	Quantitative Dominant	
Qualitative	Mostly Qualitative with some quantitative	Equal amounts of Qualitative and Quantitative	Mostly Quantitative with some qualitative	Quantitative

Note: Graphic of the Three Major Research Paradigms adapted from “Toward a definition of mixed methods research” by Johnson et al. (2007). *Journal of Mixed Methods Research*, 1(2), p. 124.

In my study a greater emphasis is placed upon the qualitative data, therefore I claim my study to be *qualitative dominant*. However, in doing so I am not fully following the definition of this type of research as put forward by Johnson et al. (2007), whereby the researcher relies upon a “qualitative, constructivist-poststructuralist-critical view of the research process” (p. 124). As I described earlier, my position is one of pragmatism and so I have chosen this qualitative dominant approach as I believe it is best suited to exploring my research questions. To be clear, this does not mean I am dismissing a constructivist approach, but merely rejecting the notion that my study is to be seen as wholly embracing the paradigm.

A crucial aspect of mixed methods research is how the qualitative and quantitative aspects of the study will be integrated or mixed (Guetterman et al., 2015). Fetters and Molina-Azorin (2017b) define this topic of integration or mixing as “as the linking of qualitative and quantitative approaches and dimensions together to create a new whole or a more holistic understanding than achieved by either alone” (p. 293). Even though this is such an important dimension for mixed methods research, the language used by researchers to describe

integration still lacks clarity (Fetters & Molina-Azorin, 2017a; McCrudden et al., 2019). To help with this it is important to be explicit and follow a mixed methods research design.

There are several different designs that have been put forth by researchers in the last few decades. I have chosen to follow one of the three core types of mixed methods research designs as mentioned by Creswell and Clark (2017), those being; convergent, explanatory sequential and exploratory sequential. Guetterman et al. (2015) have described the differences in these designs in the following way.

The convergent design is where the collection of both qualitative and quantitative data occur simultaneously and are then followed by an integrated analysis. In contrast, the explanatory sequential and exploratory sequential designs, have as their name suggests, sequential data collection. In explanatory sequential design the quantitative data collection precede and help inform the qualitative section of the study. The reverse is true of exploratory sequential design, where qualitative data are collected first and this leads to the subsequent quantitative section (p. 555).

In these mixed methods research designs it is not just the timing of the data collection and analysis that is important but the intent of the integration. How these designs differ in this respect is shown in the table below.

Table 2 *Mixed Methods Research Design*

Design Type	Timing of Data Collection	Timing of Analysis	Intent of Integration
Convergent	<u>Concurrent Collection</u> <i>Qualitative and Quantitative together</i>	<u>Independent analysis</u> <i>Merge Findings</i>	Generate interpretations that extend the breadth and range of the inquiry and/or seek corroboration
Explanatory	<u>Sequential Collection</u> <i>Quantitative then Qualitative</i>	<u>Dependent analysis</u> <i>Sampling- Connecting</i>	Use the qualitative strand to elaborate, enhance, or explain some finding of interest from the quantitative strand
Exploratory	<u>Sequential Collection</u> <i>Qualitative then Quantitative</i>	<u>Dependent analysis</u> <i>Development-Building</i>	Use the qualitative phase to create or build a follow-up quantitative instrument or intervention

Note: Mixed Methods Research Design adapted from “Mixed methods in educational psychology inquiry” by McCrudden et al. (2019), *Contemporary Educational Psychology*, 57, 1–8, p. 4.

When these definitions were considered, what seemed to be the preferred mixed methods research design choice for my study was *explanatory sequential design*. The justification for this choice of design is now discussed.

3.2.5 Justification of explanatory sequential mixed methods research design

Tashakkori and Creswell (2007) consider studies are mixed if they contained qualitative and quantitative approaches combined in a single study. Therefore, I consider my study to be mixed because it contains a quantitative, survey approach, which then informs and helps frame a qualitative case study. Throughout my study two types of data are collected:

numerical and textual. These are analysed by employing both statistical and thematic methods.

My data collection is sequential, with the quantitative occurring first allowing the qualitative phase to elaborate and enhance the understanding of the quantitative strand. I am therefore engaging in an *explanatory sequential mixed methods research design*. Creswell and Clark (2017) argue that the rationale for employing this approach is one where findings are sought which give a general overview of the phenomenon being investigated. Then, further analysis is needed to refine the explanation of the general situation.

I chose a survey method in order to identify trends and to see if it was possible to make any inferences. Another equally important reason for engaging in this first phase was to help identify which schools I wished to continue into the second, more process and descriptive focussed stage. This second phase was centred around a case study structure, carrying out semi-structured interviews. A description of how both these methods were applied to this study are addressed in subsequent sections.

The structure will follow a similar process as described by Subedi (2016) in the table below.

Table 3 *Explanatory Sequential Mixed Methods Research Design*

Phase	Procedure	Product
Quantitative Data Collection	Survey	Numerical Data and Semantic Differential Data
Quantitative Data Analysis	Use of descriptive and inferential statistics	Meaningful measures
Qualitative Data Collection	Survey	Textual Data
Qualitative Data Analysis	Coding and thematic analysis	Similar and different themes and categories
Connecting Quantitative and Qualitative Phase	Selection of participants purposefully and interview questions development	Interview protocol
Qualitative Data Collection	In-depth interview	Textual data
Qualitative Data Analysis	Coding and thematic analysis	Similar and different themes and categories
Integration of the Quantitative and Qualitative results	Interpretation and explanation of the quantitative and qualitative results	Discussion, implication, future research

Note: Explanatory Sequential Mixed Methods Research Design adapted from “Explanatory sequential mixed method design as the third research community of knowledge claim” by Subedi (2016). *American Journal of Educational Research*, 4(7), p. 574.

I now move to the review of the methods applied to my study. I begin with the national online survey.

3.3 Methods

3.3.1 *The national online survey*

My study aims to provide insights into how New Zealand secondary schools understand and utilise national qualification data for improving learning and achievement. In particular, I am curious to know if there are any commonly held beliefs and or approaches to this important topic for schools. In order to canvas responses from as many schools as possible, also considering the financial and time restraints, I decided that a survey approach, which is commonly used in educational research (Mertens, 2014), would provide that national overview.

There are several different modes available to administer a survey such as by mail, telephone, personal interview or an online survey. For my study I have opted for an online survey. As Loomis and Paterson (2018) state, “online surveys (also referred to as Web-based or Internet surveys) have become increasingly popular over the past decade” (p. 135). The reasons for this rise of popularity of research method are due to the practical considerations of cost and time, the two biggest survey constraints and the main factor governing my decision to adopt this method.

To present a quality survey, it is important to describe the design, implementation, and subsequent collection of the survey data to be analysed. However, as Jedinger et al. (2018) point out “there are few concrete guidelines” as to how to achieve this (p. 1). I now move to describe my approach towards ensuring survey quality and to introduce the concepts of total survey quality and total survey error.

Total survey quality (TSQ) and total survey error (TSE)

In the literature the response to dealing with survey quality has often been to focus on survey error. It must be stated here that survey error does not involve mistakes as such, but more the possible deviation of the results from the sample created by the survey responses when compared to the population being investigated (Groves et al., 2009). It is important to always consider the main possible sources of error when undertaking a survey and attempt to minimise them (Blair et al., 2013).

The common term used to describe this approach is *total survey error* or TSE and has even been described as a paradigm (Lyberg & Weisberg, 2016). Several authors have presented

TSE as a framework or approach to carrying out survey research (Biemer et al., 2017; Groves & Lyberg, 2010; Jedinger et al., 2018; Lyberg & Weisberg, 2016). I have chosen in my study to not fully embrace the TSE paradigm because of the difficulties and time constraints of statistically attempting to quantify survey error, one of the aspects of fully embracing this framework. Groves (1987) describes two different approaches to dealing with survey error, “there are the measurers who try to build empirical estimates of survey error and the reducers who try to eliminate survey error” (p. 2). I feel it is important to acknowledge here that I am in the reducer category. While I am not ignoring these possible errors, neither am I attempting to measure them.

Another approach to ensuring an effective survey is to see TSE as simply one dimension of overall survey quality. Lyberg and Weisberg (2016) discuss the concept of *total survey quality* (TSQ), first introduced by Biemer (2010), as being made up of three aspects of a survey, these being the; accuracy (which involves the minimising of TSE), credibility and relevance. I now move to unpack each of these aspects in turn as I have related them to my survey to ensure quality.

Accuracy relates to the attempt to control and minimise *total survey error* (TSE). Dillman et al. (2014) identify four types of error to minimise in order to improve the quality of a survey. They describe these as “the four cornerstones of quality surveys” (p. 3). The types of error are – the error occurring from a non-representative sample (coverage error), the error due to the use of a sample to reflect the entire population (sampling error), the error resulting from those not responding holding different views to those responding (non-response error), and finally, the error owing to respondents not providing accurate answers (measurement error). In the description of both the design and implementation phase of the survey I have made explicit reference to these possible sources of error and the steps taken to mitigate them.

A survey is said to have credibility if the “data can be considered trustworthy by the survey community” (Biemer, 2010, p. 819). I have attempted to achieve this by including all the paradata (data about the process by which the survey data was collected) (Biemer et al., 2017) in the sections on survey design and implementation.

Each survey question is deliberate in its attempt to illicit a response to a different dimension of my overarching research question. However, the survey must also have relevance to the participants as well. For this reason, the survey was targeted at those people in a school for

whom the use of assessment data would play some part in their role. The process undergone in the design of my survey is now presented.

Survey Design

I begin this section with a summary of my survey as a whole, as shown in the table below. This portrays details of the final statistics, role of the respondents and a brief outline of the survey structure.

Table 4 *Survey Details*

Statistics	Design
Sent to 341 schools 78 responses, 56 fully completed	Mixture of Qualitative and Quantitative data 7 Questions
3 types of respondents <ul style="list-style-type: none"> ○ Principals ○ Senior Leaders ○ Middle Leaders 	Topics of interest <ul style="list-style-type: none"> ○ Importance ○ Purpose ○ Description of use of assessment data ○ Confidence ○ Challenges ○ Leadership Actions ○ Resourcing

Having provided a brief overview of my survey’s details and introduced my respondents, I now explain how I responded to methodological advice on survey construction in setting up my survey. The remainder of this section on survey design is broken into two parts. The first relates to how the population was determined and where the data was sourced for the potential participants. The final section describes the process of question design and how accuracy was controlled by taking steps to minimise possible sources of error.

Identifying the population

Before engaging in survey research, the prospective survey respondents need to be identified. The most important question needing to be addressed is; who has access to the knowledge or opinions being sought (Mertens, 2014). Thus, the target population for the survey needs to be clearly defined.

The target population for my study was all secondary schools in New Zealand. The reason for not choosing primary or middle schools was due to them not undertaking any large-scale formal qualification assessment. My initial thought was to include only those secondary schools who use NCEA as their primary form of qualification. In doing so I was set to discount the schools who were not following the standard New Zealand curriculum, but were engaged in International Bachelorette, Cambridge, or other curricular. However, on deeper reflection I realised that there was no particular advantage restricting my study to one qualification because my interest was to explore the leadership actions, and the challenges and obstacles encountered in establishing effective use of qualification assessment data. Thus, I proceeded to include the widest selection of schools as possible, in an attempt to ensure that I did not miss the opportunity for valuable insights and to minimise a possible source of coverage error. In effect I was attempting to take a census approach towards the survey, where every member of the known population was included in the survey dissemination. Although being well aware that due to non-response, my survey would result in replies from only a sample of the population.

The schools surveyed were selected by accessing the “Schools Directory Builder” on the New Zealand Government website Education Counts (<https://www.educationcounts.govt.nz/data-services/directories/list-of-nz-schools>). The school types selected were – Composite, Secondary (Year 11 – 15), Secondary (Year 7 – 15) and Secondary (Year 9 – 15). The resulting list was then filtered to include only those schools with valid email addresses, leaving 472 individual schools. This number was then further reduced to 341 schools following the process and reasoning as described in the section relating to survey implementation. With the population defined I now turn to the question design process.

Question design

The objective of a survey is to ask questions in such a manner that the respondents provide valid and reliable answers, in order to measure the concepts of interest (Dillman et al., 2014). In this sense it is crucial to develop a well-constructed set of questions that are designed to avoid ambiguity and encourage response. The questions in my study underwent numerous iterations under the guidance of my supervisors in order to increase precision of meaning reducing measurement error and focus responses on the most important issues I wished to investigate.

Before starting the survey, demographic data was collected from respondents in order to be able to aggregate the responses during the analysis stage. This data consisted of school type (public, private, single sex, co-ed), decile rank (“The school decile system in NZ is used to allocate school funding. School deciles are based on the catchment area of a school. A decile rating of 1 is assigned to the 10% of schools with the highest proportion of students from low socioeconomic communities” (Meehan et al., 2019, p. 1132)) and position of the person completing the survey (principal, senior leader, middle leader or teacher).

I acknowledge that schools are busy places, and so I designed my survey with that in mind, keeping the number of questions to a minimum, whilst retaining enough substance as to help address my research questions. The questions were distilled down to seven main areas of focus, with three questions exploring attitudes and four asking for descriptions. The ordering sequence of the questions was purposeful and key to putting the answers to the questions in the proper context. The importance and purpose the responding school placed upon the use of qualification assessment data to improve learning and achievement was placed at the beginning of the survey. These two questions were closed attitude questions and utilised a *semantic differential* scale type response structure. I chose this question type as “this format of assessment includes fewer items and requires shorter time to respond as compared to a typical *likert-scale* measurement” (Kahveci, 2015, p. 5). In the first question the two bipolar semantic terms utilised were the graduated antonyms of, no importance and high importance. An even number of possible graduations were given to choose from (i.e., four options). This was deliberately done thus requiring the respondent to establish their position as there was no middle choice. By contrast the next question, exploring the purpose of assessment data use, had five possible options. In this case I felt that by including a middle choice gave greater insight into the respondent’s position on this concept. This question was heavily reliant upon the respondent’s understanding of the semantic definitions of the terms “*accountability*” and “*professional development*”, as these were given along a bipolar scale. As presented in Chapter 2, the literature describes tension existing between these two elements of assessment use.

The definition of these terms may be subjective however, these are terms commonly used throughout the education community. That said, it is important to understand how the respondents apply them to the topic of assessment use. Therefore, below each of the semantic differential attitudinal questions was a text box asking the respondent to explain and so clarify

their answers. This was done deliberately, not only to add a qualitative check for internal consistency and reliability of the use of the semantic differential style questions, but also to include a deeper description of the context of the response.

The final semantic differential type of response question is fourth in the survey sequence and investigates the confidence that the respondent has towards their school's optimum use of assessment data to improve learning and achievement. Like the first question, the two bipolar semantic terms utilised were the graduated antonyms of, no confidence and high confidence, with an even number (four) of possible graduations to choose from.

The remaining questions in the survey are open-ended short answer questions. This type of question lets the participant freely respond in their own choosing and so are analysed thematically (Mutch, 2013). The open-ended short answer questions had key words bolded to ensure clarity of expected response. This style of question was included to reduce the impact of question structure on recipient's responses and so minimise measurement error. I felt that including a possible array of responses while investigating the concepts of data use, challenges, leadership actions and resourcing, may influence the survey answers and hence add an aspect of bias.

Upon finalisation of the questions and structure, I was surprised at the amount of qualitative data that I was collecting from what I had initially seen as my main quantitative tool. This had not been a conscious decision but rather a result of greater reflection throughout the process on my study topic. While constructing the survey I was forced to constantly re-examine my questions and the overall goals of my project. The greater tendency towards qualitative data collection grew out of my increased desire to capture a more descriptive, rather than comparative, view of the field of assessment use in schools.

The last stage of the design process was to transfer the survey onto the web interface of Qualtrics, an online survey software platform ready for implementation. The dissemination of the survey is now outlined, including the difficulties encountered and the approaches taken to overcome them.

Survey implementation

The first step of implementation was to gather the emails taken from the "Schools' Directory Builder" on Education Counts website of the Ministry of Education and upload them to the

Qualtrics software program to prepare for dissemination. Using this interface, an introductory email was sent out to all the schools on the directory with a link to the survey included. To be honest, I was disappointed with the initial amount of response to my first contact with schools. After the first two month cut off, (the time I had selected to close off the survey) I had less than 20 completed surveys. I looked to the methodological literature and the advice offered by Nulty (2008) to boost an online survey response, namely; sending reminder emails to non-respondents and extending the timeline for survey completion. Despite these steps, the uptake was still not sufficient. I wondered whether this was due to online survey fatigue and indicative of schools showing their resistance to further reminders, a reason offered by Cook et al. (2000).

My conclusion that survey fatigue could explain the reason for a disappointing survey response rate was signalled in communications I received from one Head of Faculty who lamented the lack of time she had available to participate in the survey and she wished me well in my research. The sad part of this was that in the amount of time it had taken to pen that email she could have completed the survey. However, I was very glad she did as it gave me evidence of at least one important reason of non-response, time.

Approximately two months after the survey had closed, I received an email from my own school's administration secretary. It was the introductory email with an offer to participate in my survey. On further investigation I ascertained why it had taken several months to make its way to me. I discovered the delay lay with the email dissemination method employed by the software Qualtrics that I was using for the survey. The covering letter with the survey link had been sent out as a bulk email to all the participants. In talking with my school's secretary, I learnt that our school was being bombarded with bulk emails so that all such emails were automatically moved to a '*junk*' folder only to be looked at when time permitted. I immediately wondered if this was the case in other schools and if so, it could be a major source of non-response.

With this information I decided to embark upon a different method of follow-up distribution. My next strategy was to email each school individually from my university email account and target the emails to a specific person within each school. I also changed my source for school emails opting for a list compiled by the New Zealand Qualifications Authority (NZQA) of School Liaisons. This list only contained those who were prepared to have their email shared across schools and so reduced the population from 472 schools to 341 schools. This of course

increased the possibility of coverage error, and a point I acknowledge. The email addresses in this list were individual teacher school emails making them far more targeted and no longer relying upon school administration staff to forward them on to the relevant staff member.

The impact of employing this technique resulted in triple the amount of completed surveys inside the set timeframe. In total the survey elicited 78 responses with 56 fully completed surveys and 22 surveys where only the demographic data had been completed. This meant that 22 respondents had gone to the trouble of opening the link and filling out the initial data collection. However, after moving to the screen where the survey questions were viewed, they had opted not to participate. I can only speculate as to the reason why this was the case, but I believe it is related to the number of open-ended items. This, though disappointing, was not a surprise, and had been considered during the question design phase. It was decided that having descriptive closed questions, although significantly reducing the response time needed, had too great a possibility of adding bias and so open-ended descriptive questions were deemed the most appropriate. This direction was taken being fully aware of the possible negative impact that this may have upon response rate. Although I had desired to have a higher response rate I took heart from Rindfuss et al. (2015) who suggested “low response rates need not necessarily lead to biased results” (p. 798), and Krosnick (1999) who stated “it is not necessarily true that representativeness increases monotonically with increasing response rate” (p. 540). So, the most important consideration was to determine if there were any voices not being heard that would alter the way in which the results of the survey may be interpreted.

With closer inspection of the survey questions, the question relating to the importance of the topic itself seemed to be the most vulnerable to non-response error. If a school chose not to respond due to the low priority it had for the subject matter, then data reflecting their belief of the low importance of assessment data being used for the improvement of learning and achievement would not be sampled. This may influence the survey results and could be a possible explanation why no respondent selected the option “no importance”. Therefore, when analysing the results, care must be taken with any inferences to the population as a whole with regards to the importance of the topic in schools. The analysis of the results of my survey are presented in the next chapter (see chapter 4).

3.3.2 *The case study*

The second method of data collection utilised for my research, the case study structure with interviews, is now presented. I begin by considering the definition of a case study and present an argument for its appropriateness to be used as an instrument in my research. I then return to the literature and the work of three other researchers in education in the United States, undertaking studies of a similar topic using a case study structure and regarding assessment practices in an educational setting. I do this in order to examine their methodology and methods and to inform my approach to case study research.

I now consider each of these studies.

Other researchers who utilised case study research

The three studies chosen to investigate are, Moore (2014), Pinkerton (2014), and Michaud (2015) as each of these researchers were investigating an aspect of data use and each engaged in a different case study approach. These studies are all set in the United States, as the use of assessment information has become particularly relevant since the implementation of the “No Child Left Behind” program (Moore, 2014; Pinkerton, 2014; Wayman, 2005). In fact in the United States “advocates tout data-driven decision making or DDDM as the next major strategy to support instructional improvement and student achievement, or, as some have described, “the mantra of the day”” (Marsh & Farrell, 2014, p. 3).

Each study is now considered individually, to describe in further detail the nature of the study and the methods employed, following the structure of scope, methodology, methods, and finally limitations.

Study No 1: Moore

Scope - Moore’s study (2014), focussed on how secondary Mathematics and English teachers described data-driven decision making. The study took place across three New Jersey schools, involving 18 teachers and 4 administrators.

Methodology - Moore defined his methodology as employing qualitative methods for which he referenced Creswell (2007) to elaborate upon his definition. The importance of the contextual aspect of his research came through strongly in his description of his method, thus determining that it is to be idiographic in nature, attempting “to describe and understand what is unique and distinctive” about the particular context (Arthur et al., 2012, p. 10). This led to Moore’s choice of a comparative case study method, with the justification of the comparison to give a fuller exploration of the context. The use of case studies seemed a reasonable choice

given the emphasis placed on context, but the use of comparison added a quantitative dimension to the research. Moore further justifies this choice by referencing Yin (2014), who argues that when exploring phenomena in context, case studies are a well suited method to employ.

Methods - The data collection methods that Moore undertook mostly involved interviews, but also included analysis of school documentation and reviews of the relevant professional literature. Demographic data on each of the participants was also collected in order to provide, “a view into a “what’s possible” scenario for data-driven decision making” (p. 29). For the interviews, Moore utilised the standardised open-ended interview protocols, as put forward by Patton (2002). These helped him control the length of each interview to remain between 30 to 60 minutes. Moore notes that this was important, due to the “naturalistic setting” of the workday (p. 31).

Limitations - The main limitations of the study outlined by Moore, discussed concerns around representativeness, in particular, the depth of penetration of the issues, stating that the range of dimensions covered in the study diminished his ability to probe more deeply. In addition, due to the “highly subjective perceptions”, just how “widespread the awareness” of data use was, proved hard to ascertain (p. 40). The lack of a normative definition of data-driven decision making and common language of data analysis also created difficulties. This was seen more clearly when Moore in his final summary, attempted to generalise some of his findings. While generalization is not necessarily the goal of qualitative research, it did lead him to qualify his findings “as the reported perceptions of teacher participants only” (p. 97).

Study No 2: Pinkerton

Scope - Pinkerton (2014) researched school leaders’ perspectives of the efficacy of data-driven decision making on student achievement. The study was conducted in the state of Georgia.

Methodology - Unlike Moore (2014), Pinkerton did explicitly state under which paradigm she was operating, “*constructionist-interpretive*” (p.45). She was also clear in defining her theoretical framework. That being; the “*Theory of Planned Behaviour*” (TPB) as developed by Ajzen (1985). This theory tries to decipher “the main determinants of a person’s intention to perform a planned behaviour” (Pinkerton, 2014, p. 12). This helped focus and direct the research.

Pinkerton described her approach to research as being qualitative, which is consistent with the *interpretive/constructivist* paradigm under which she is working. She references Denzin and

Lincoln (2005), in her justification of choosing qualitative methods, since they involve “an interpretive, naturalistic approach to the world” (p. 16). Like Moore, Pinkerton also quotes from Creswell (2007), although in this instance it is to explain her reasoning behind using a case study method. Although she also used a case study approach, hers was evaluative, rather than the descriptive method followed by Moore. Pinkerton chose this method because “it lent itself nicely to evaluating an educational program”, that of the success of data-driven decision making, from the perspective of the school administrators (p. 45).

Methods - The data was collected using the research tool of Online Pseudo-Depth Interviews, which Pinkerton argues “give the participant time to think about the questions in order to share insightful information” (p. 48). She justifies her choice by referencing Hamilton and Bowers (2006), and reinforces the advantages of time efficiency and transcription reliability.

Limitations - The limitations of the study were not discussed in any depth, only inexperience of the school leader, which was countered by the sampling method used and lack of time for face-to-face interviews were mentioned. The lack of face-to-face interviews was countered with a delimitation paragraph, emphasizing the virtues of online surveys.

Study No 3: Michaud

Scope - Michaud (2015) examined teacher learning in a data team of five teachers who met twice weekly in a suburban Massachusetts school, over a six-week period.

Methodology - Michaud also employs a qualitative case study approach, but unlike either Moore or Pinkerton, his was exploratory in nature. He argues that the advantage of using such an approach, was that the positioning of individuals could be “more precisely described” when subjected to “critical analysis of the team’s discourse” in its context (p. 37). Michaud further elaborates to define speaking as “a social construct, as well as a linguistic one” emphasizing the importance of “the historical and socio-cultural experiences of the data team members” (p. 37). His theoretical framework being evident in his title, that of a social constructivist perspective, was chosen to get “a clearer understanding of the professional learning of teachers on data teams, because it emphasized how participants changed as a result of their collaboration” (p. 12).

Methods - He chose a case study method in order to “pursue a variety of possibly significant emerging factors, and to explore in depth targeted areas by incorporating multiple perspectives in a detailed contextual analysis” (p. 39). The data collection involved five observations and five interviews, as well as analysing any artefacts from data team meetings.

Limitations - Michaud lists three main limitations of his study. The first is common to Moore, that is the issue relating to generalizability. This is due to the context reliant qualitative nature of case studies (Bazeley, 2013). The second limitation is common to all three studies and that is time. For Moore and Pinkerton, it was the time needed to undertake the depth of data collection wanted, whereas for Michaud it was the desire for a more longitudinal approach to measure change and impact. The last limitation noted, relates to the first, and is also a consequence of a case study, the fact that the study is not necessarily representative. This difficulty was similarly highlighted in the study by Moore.

A summary of the methodological paradigms under which the three researchers operated is now presented, with a comparison and definition of qualitative and quantitative research.

Summary of paradigms and methods

All three researchers approached their studies from what seems to be an *interpretive/constructivist* viewpoint. That is to say the researchers emphasized the “importance of the participant’s view” and “stressed the setting or context” (Cresswell, 2008, p. 50). This is in contrast to the *positivist’s* perspective of research, which holds that the world can be “understood by scientific examination” (Gay & Airasian, 2000, p. 9). Not all the studies are explicit in defining the paradigm under which they are working, however, their choices of methods are mostly all qualitative in nature, although some quantitative data was collected. This fits with their interpretive/constructivist viewpoint, as they were each attempting to undertake research which produced “a detailed understanding of a central phenomenon” (qualitative research) and they were less interested in completing research which contained “a description of trends or an explanation of the relationship between variables” (quantitative research) (Gay & Airasian, 2000, p. 51).

The researchers in each of these three studies have chosen to make use of the method of case studies for their investigations. Each chose this design as they believed that their topic being researched was dependent enough on context to require it. However, they each used a different perspective to undertake their study, these being; descriptive (Moore), evaluative (Pinkerton) or exploratory (Michaud). The methods employed also differed, from structured interviews, semi-structured interviews, online open-ended surveys, observations, to document analysis. The theory which the individual researchers deem to follow, has dictated their choices in both methodology and methods, highlighting the need for underlying theory in research (Mutch, 2013).

I describe now how the importance of context and the nature of my research question led me to decide upon employing a *descriptive multi case study* structure. The method taken to choose the schools involved, the interview design and protocols, validity and reliability, my role as the interviewer, limitations and the ethical considerations taken into account in my research are outlined in this final section.

The case study structure

The definition of what constitutes a case study is wide ranging. In fact as Scott and Morrison (2006) argue, all research in some sense involves cases. In educational research a case may be seen as an individual, a school or a program or policy within a school (Ashley, 2012a). In other words, it can be seen as a “bounded system” (Stake, 2009, p. 8), and the research is placed in reference to the specific context being investigated. The use of a case study method is appropriate since the purpose of my research is to study what is naturally occurring in a school situation, where the variables are not and cannot be controlled. This distinguishes it from a positivist experimental approach (Scott & Morrison, 2006). As Stake (2009) put it

When explanation, propositional knowledge and law are the aims of an inquiry, the case study will often be at a disadvantage. When the aims are understanding, extension of experience and increase in conviction in that which is known, the disadvantage disappears (p. 19).

Using a case study method enabled the dimension of context to have prominence within my research. Since my research is *intensive* (focusing on a few selected schools) rather than *extensive* (obtaining data from a wide reaching array of schools), it fits a more open-ended, flexible style, which according to Eckstein (2009) also solidly points to *case study* as a research method.

In my research the case is to be seen as the process of utilizing NCEA assessment information within each school investigated. Each school is considered an individual case and I have chosen to sample three schools, hence the need for a multi case study. There are many types of approaches to case study methods which are all dependent upon the nature of the research to be undertaken and the underlying theory upon which it is based. Yin (2014) groups case studies under four main headings, these being: exploratory, descriptive, explanatory and evaluative. Exploratory designs are used when the research questions are yet to be well defined and are often utilised as the basis for subsequent research. Explanatory and Evaluative designs attempt to ascertain why events occur and hence propose cause and effect relationships. The final type of case study, descriptive, is defined as a design which attempts

“to present a complete description of a phenomenon within its context” (Algozzine & Hancock, 2017, p. 33). I have chosen to define my research as a *descriptive multi case study* as this method is best suited to helping me answer my research question of “To what extent and in what ways do secondary schools use NCEA assessment information to improve learning and achievement?”. My question is more directed towards the description of the “how” of the phenomenon of the use of assessment information, which as Yin (2018) suggests, points firmly towards a descriptive case study.

My study is cross sectional (snapshot) rather than longitudinal, however, I must be careful as Gay and Airasian, (2000) mention, that having a single time period does allow for sufficient perspective to be gained in the processes involved. Throughout my study I worked upon the assumption that the use of assessment information within the schools investigated did not significantly change over the period of my study.

The structure of my case study is now discussed with attention given to case identification and the interview process.

Case study design

I begin this section with an overall summary of my case study, as shown in the table below. This portrays details of the types of schools, role of the respondents and a brief outline of the case study structure.

Table 5 *Case Study Details*

Statistics	Design
Three schools - Integrated Girls School Decile 9 State Co-Ed Decile 3 State Co-Ed Decile 8	Semi-structured interview
9 Interviews conducted	7 Questions
3 types of interviewees in each school	Topics of interest
<ul style="list-style-type: none"> ○ Principal ○ Senior Leader ○ Middle Leader 	<ul style="list-style-type: none"> ○ Importance ○ Description of use of assessment data ○ Success of data use -positive and negative ○ Leadership Actions ○ Challenges ○ Solutions

Now that the structure of my case study has been presented, I explain how I selected the schools that were invited to participate in my research.

Case identification

The use of sampling logic for the choice of case selection (school) did not seem relevant for my study. As Yin (2014) puts forward, that multiple cases should be chosen for the expectation to find similar results or dissimilar results for particular reasons. Therefore, I had originally intended to sample the schools I wish to investigate by using a combination of convenience sampling and stratified sampling. Convenience sampling had some appeal because it had the added advantage of keeping the costs and logistics down, by reducing the need to travel and by having far greater flexibility as to where and when the information gathering could take place. I was also attracted to stratified sampling as I was interested if the socio-economic influences on a school impacted in any way the methods and processes employed for utilising assessment data. However, after reading the Education Review Office's report on raising achievement in secondary schools, I became very interested in examining the schools which the Review Office seemed to think were exemplifying good practice (Education Review Office, 2014). These were the schools that in the Review Office's opinion were making effective use of NCEA assessment information and raising student achievement as a consequence. However, the identification of these schools raised ethical issues both for the release of the information from the Review Office and for my own research.

I then decided to take a completely different approach and utilise the information gained from the national online survey. This removed the ethical constraints raised above and enabled the selection of schools to be more targeted and purposeful. As I was interested in determining the particular leadership actions taken and the possible challenges and obstacles encountered in effective data use, I felt it was necessary to choose a school who felt that assessment data use itself was an important issue. Therefore, I considered the responses from the national online survey and looked at those schools who had answered that assessment data use was of '*high importance*' to them, a purposive sampling approach. I wanted to choose multiple schools, not for comparison but rather as an attempt to gain a broader understanding of the approach towards data use across a range of school types with differing levels of confidence of the effective use of achievement data. So, I chose three schools that had high, moderate, and low levels of confidence in their school's use of assessment data. My final criterion for

selection was to have a range of school types and socio-economic demographic leading ultimately to my selection of an Integrated Girls school (decile 9) and two State Co-Educational schools (decile 3 and decile 8) (as mentioned earlier in the chapter, the decile ranking reflects the socio-economic status of the contributing community).

I now move to explain how the data were collected from these selected schools. This took the form of semi-structured interviews. These interviews shaped the basis of my qualitative research, focussing on methods, processes and interactions related to qualification assessment data use in improving learning and achievement in secondary schools. A description of the interview design, validity and reliability, my role as the interviewer, and limitations follows.

Interview design

Interviews form a very important part of my study. The advantage of using this method was the ability to react to responses, and so deepen the description of the topic. There are three main types of interviews that can be conducted; open-ended or unstructured, semi-structured and finally structured (Wilson, 2012). For my study, a semi-structured approach was chosen, as greater flexibility was desired in order to deeply interrogate responses, rather than adopt a more constrained method such as structured interviews. Unstructured interviews were dismissed as a method, since an aspect of comparability to help with triangulation was preferred and as Wilson (2012) states, this can be problematic when the questions are open-ended.

The questions used for the interview process were formed through an iterative process, similar to how the survey questions were developed, with multiple revisions and discussions with my supervisors. In addition to this, two pilot interviews were undertaken to test the nature of the initial questions to see if they were eliciting the type, and depth of response expected.

I found this pilot study to be extremely informative, not just for practicing interviewing technique, but for refining the questions themselves. Throughout the pilot study I realised that the term ‘assessment’ needed to be explained and made far more explicit in relation to my study, as the respondents often branched off into descriptions of formative assessment practices giving particular reference to junior assessment and not the qualification based summative assessment that I was interested in. Although I acknowledge that this is an important topic, it was not the focus of my study, so I found myself having to redirect, and at times stop the interviewee from proceeding down an important, but unrelated path.

Another important shift in the definition of terminology to be used involved changing the term assessment results (used for the national survey) to assessment information (for the case study). Although these words can appear to be interchangeable, the word *information* encompasses more than simply raw data. I believed this distinction was important to portray because the emphasis on the sense making was one aspect that the case study approach enabled to be explored.

A final crucial learning that occurred while conducting the pilot interviews was the need to emphasise from whose perspective that I wished to view the topic of assessment data use from. In my study it was the leadership actions and ability to influence assessment data use that I wished to investigate. The interviewees often moved into descriptions from a student perspective, which did help from an overall contextual view but at times tended to overshadow the leadership aspect of the conversation. This disrupted the flow of the interview and led to a significant rewording of the interview questions and a change to the interview protocol, in order to ensure clarity of purpose from the outset.

The final version of the interview questions began with establishing the respondent's strength of belief in the importance of assessment data use in schools and then progressed through to procedures followed, description of specific leadership actions taken to influence data use, and finally to exploring challenges, and methods taken to respond to those challenges. There are seven questions included in the interview and five subsequent probes, all of which were given to all interviewees well in advance of the interviews taking place. This was to give the participants time to consider their responses. Upon conducting the interviews several interviewees referred to written notes that they had pre-prepared. The typical duration of the interviews was approximately 45 minutes. All responses were digitally recorded, although throughout the pilot study I had also endeavoured to take handwritten notes. I decided against continuing to do this as I personally found it difficult to fully concentrate on what was being said and so began to summarise comments. The pilot interviewees seemed to watch the summaries I was writing, and I felt that my behaviour, as the interviewer, was possibly influencing their responses. Whereas the simple presence of the recording device did not seem to distract or make any of the interviewees uncomfortable eliminating the need for handwritten notes. However, since there was to be no handwritten backup, I made use of several different recording devices at the same time to ensure that the interview was successfully captured.

All the final interviews were professionally transcribed. In every school in my study three people were interviewed. The first was always the principal, the remaining two others were self-selected by the principal to reflect; the senior leader with direct responsibility for assessment data use and a head of department who the principal felt exemplified data use in the school. A copy of the final interview questions used are included in Appendix C.

Development of cross case themes

The development of the themes with which to describe the responses to the semi-structured interviews was the result of allowing concepts to emerge from the responses (inductive analysis) rather than resonance with an existing framework (deductive analysis). This was not completely devoid of structure however, as throughout the process I kept the main research questions of the study firmly in mind. I repeat these questions again here, not only to enable this chapter to be read in isolation, but also as a reminder of the main purpose of this thesis. The overarching question which is guiding my research is:

To what extent and in what ways do secondary schools use NCEA assessment information to improve learning and achievement?

There are two main aspects that the research will focus on, deliberate leadership actions, and challenges and obstacles. These govern the formation of the sub-questions linked to the research question.

Sub question 1: What are the challenges that school leaders encounter in gaining insight into NCEA assessment information?

Sub question 2: What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

Thus, I established overarching concepts as a lens through which to view the data, then attempted to discover themes appearing from the participants responses to the interview questions. The titles I chose to represent these themes were, *setting the scene* (relating to information relevant to my primary research question), *challenges* and *leadership actions taken to overcome challenges* (reflecting my two research sub questions), concluding with *insights gained*.

I attempted to be independent and 'open' to what the data was saying however, the difficulty in interpreting the responses in a truly detached manner must be acknowledged. I was forced to be constantly reflective and always deeply aware of my inevitable personal bias. The first

interview was analysed for concepts, leading to the development of an initial coding framework (Appendices D & E). Subsequent interviews were then coded using a combination of both template coding and open coding resulting in the introduction of additional codes. With the introduction of these new codes all the interviews were then re-analysed. This iterative process continued until all 9 interviews were fully coded according to the two conceptual framework templates. The codes were then distilled and collated into themes separated into the two overarching concepts of *leadership actions* and *challenges*. A description of these themes, along with a brief explanation of the reasoning behind their choice, now follows.

The first theme of *setting the scene* is discussed using four sections, importance and purpose, structure and processes utilised, creating information through analysis, and sense making. I will briefly outline the concepts explored in each subsection, starting with *importance and purpose*.

Although all case studies were purposely chosen because they had stated that the use of NCEA assessment information was of high importance to them, I wished to unpack this notation further to investigate if there was a common underlying belief, not only between the cases but also within each individual case across the levels of authority. I was interested to know if anyone throughout the cases would explicitly relate importance, to specific leadership actions.

The subsection *structure and processes utilised* is next. Schools in New Zealand have the autonomy to delegate responsibility and design their own reporting and accountability structures inside their own schools in relation to many aspects of leadership including the use of assessment information. Therefore, the structure and the resources applied to this topic within a school, can be seen to a deliberate leadership action.

Creating information through analysis is a description of how assessment information is utilised inside a school. Again, as mentioned above there is significant autonomy given to individual schools in New Zealand regarding this topic. This means that the expectations that have been set as to how data are used throughout a school, are a direct result of actions taken by leadership and reflect their priorities and expectations. Here the emphasis is on the process of how schools create meaning from the available NCEA data. *Creating information through analysis* depends on a process of '*sense making*', which is now discussed. This involves reflective practices, and the processes to encourage such reflection.

Secondly, I discuss the theme *challenges*. This theme collates descriptions of challenges and obstacles faced in making use of assessment data. Although this theme relates to a separate specific question in the interview, many responses touched on this theme right throughout. This highlights the interconnected relationship between how assessment data was used, and the challenges and obstacles faced.

Thirdly, the last theme investigated was *leadership actions taken to overcome challenges*. This theme examined actions directly undertaken to overcome challenges and obstacles faced, rather than those taken to reinforce processes.

The *insights gained* from the main learnings from the case study are then presented. The application of this overall structure to the interview responses was always to attempt to focus upon the leadership actions which were governing the descriptions given.

I now move to consider how the analysis was carried out.

Analysis

The analysis of the case studies took the form of *thick descriptions* of the phenomenon of assessment data use as experienced by the participants. The definition of *thick description* is often not consistently interpreted across researchers at all levels (Ponterotto, 2006).

Therefore, it is important to clarify how this term will be interpreted for this study. Denzin (1989) defined a *thick description* as a deep, dense, detailed account of problematic experiences, capturing and representing the meanings of actions for the participants of the qualitative study. It is in substance, interpretive, therefore making it important to report interpretations as they occur throughout the interaction.

An explanation of the steps taken to attempt to ensure validity and reliability is presented next.

3.4 Validity and reliability

Having strict protocols for interviews is a crucial aspect of addressing validity and reliability when conducting interviews (Michaud, 2015; Moore, 2014; Pinkerton, 2014). After every set of interviews, I engaged in review and debriefing with my senior supervisors. These reviews ensured, that I as a novice researcher, received the expertise and guidance of an experienced researcher, to have strict protocols and to go over the responses and check the analysis of the data. As Opdenakker (2006) states, it is important that the interviewer be aware at all times of

their possible impact. To do this effectively in real time, required close attention being paid to the interviewees' answers, ensuring that I gained the depth of information required inside the time frame available, whilst also attempting not to have any undue influence on the interview. Wengraf (2001), refers to this as process as paying '*double attention*' throughout the interview. This added state of attention required at times prompts, probes and strategic silences to elicit an increased state of listening (Wengraf, 2001). It also enabled me to pick up on social cues displayed by the interviewee as Opdenakker (2006) describes.

The major disadvantage of using interviewing as a means of data collection, is the possibility of the interviewer affecting the responses of the interviewee, through these same social cues mentioned above. Therefore, throughout the interviews I attempted to maintain a neutral demeanour, focussed solely upon the interviewee, and only probing for more information where I felt further clarification was needed. I kept the conversations to the point and did not participate in things like comparing, identifying, advising, sparring, or placating. All things which McKay et al. (2008), pointed out that a naïve researcher like myself, must take care to avoid during the interview process.

My interviewing skills developed throughout the pilot study as I became more familiar with the environment. I had a natural desire, which I suppressed, to engage in the interview conversations, as assessment was a topic about which I am passionate. The possible influences, that I myself may have upon the research process, are now discussed.

3.5 The role of the researcher

The questions I pursued have arisen from my personal experience, as I am an assistant principal in a New Zealand secondary school, tasked with implementing effective data use throughout the school. Since I am part of the field of which I am researching, this "requires constant attention to self-reflection and self-critique" in order to "keep the study intellectually mobile and sharp" (Walker, 2012, p. 78). Therefore, I have adhered to the advice of Walker (2012), namely by maintaining "critical reflection" throughout the scope of my study. This encouraged me to constantly evaluate my role as a researcher and focussing on letting my findings speak for themselves. This was especially true when it came to the issue of advocacy, since I myself identified with the concerns, challenges and emotions of those in the study, since I too am part of the landscape which I am investigating (Cohen et al., 2007).

3.6 Limitations

Case studies with interviews can be seen as purely verbal reports and as such subject to personal bias, poor or inaccurate articulation. However, as Yin (2018) points out, since I was directly interested in personal opinions and because the interview process involved triangulation with other interviewees, this limitation tends not to have an undue effect on the overall research.

The issue of generalizability, another possible limitation, is to be seen from a logical and analytical viewpoint as opposed to the positivist's statistical approach (Scott & Morrison, 2006). Therefore, I intend to employ *naturalistic generalization* to the findings of my case studies. This is important as it is the intention of my study to be of use to the education community. *Naturalistic generalization* enables "readers to recognize similarities in case study details and find descriptions that resonate with their own experiences, they consider whether their situations are similar enough to warrant generalizations" (Melrose, 2010, p. 600). Stake (2009) points out that because of case studies importance of experiential understanding and "because of their compatibility with such understanding, case studies can be expected to continue to have an epistemological advantage over other inquiry methods as a basis for naturalistic generalization" (p. 11). As Lincoln and Guba (2000) succinctly put it:

if you want people to understand better than they otherwise might, provide them information in the form in which they usually experience it. They will be able, both tacitly and propositionally, to derive naturalistic generalizations that will prove to be useful extensions of their understandings (p. 36).

The chapter now concludes with a brief discussion of the ethical considerations of my research.

3.7 Ethical Considerations

Research in education naturally involves human participants, therefore ethical considerations are of vital importance (Ashley, 2012b). There is a "duty of care in relation to all those participating in the research process" (Burton et al., 2008, p. 50). Throughout my study there were three primary principles, under which the ethical considerations were considered: risk and informed consent, privacy and confidentiality, and obligations under the Treaty of Waitangi. I will now present how I have attempted to address each of these important aspects whilst undertaking my research.

3.7.1 Risk and Informed Consent

Upon engaging in my research, the nature and purpose of the study was explained to all the possible participants and voluntary participation was sought. Once agreeing to participate, informed consent was explicitly sought, by asking participants to sign a participant information sheet (Appendices G, H & I). This included information concerning the details of the research and their right to withdraw from it at any stage without providing a reason knowing they would not be penalised in any way. In every case study school, the principal's consent was sought first as a point of access before contact was made with individual school leaders. An ethical issue which could have arisen, was that the principal was required to select the staff most suitable to engage in the research. As the principal is in an unequal power relationship to the perspective staff to be interviewed, those staff may have felt undue pressure to be involved and hence may have been apprehensive of the consequences to themselves if they declined to be a participant. This issue was mitigated by ensuring all participants of their privacy and confidentiality and reiterating at the beginning of each interview their right to withdraw and how this would be completely confidential. At all stages throughout the process of undertaking the research, the risks posed to all participants, were monitored and mitigated wherever possible. The participants were consulted and their views on potential risks, (seen and unforeseen), were canvassed. In addition to this, advice was continually sought from professional colleagues, experienced researchers, and supervisors, as to the risks and ways and means to minimise them during the course of my research.

3.7.2 Privacy and Confidentiality

Confidentiality was protected as much as possible through the use of anonymity throughout the course of the research. Individual schools were not identified. Disaggregating the data and reporting findings in terms of themes also reduced the risk of recognition of the sources (Darlington & Scott, 2002). Given the range of different schools sampled and their geographical locations, it is unlikely that the participants will have previously been acquainted, thereby decreasing the possibility of anonymity being compromised. While the research was being undertaken the names of the participants were kept private from other participants. However, those within each school were most likely to be aware of the others involved therefore, throughout the study care was taken to in no way adversely affect the interests of the research participants (Darlington & Scott, 2002). Any information obtained during the research such as documents, taped interviews or interview transcripts were at all times kept confidential.

3.7.3 *Treaty of Waitangi*

As this research canvasses data from New Zealand Schools, it was important that all the rights guaranteed to the indigenous Māori population, under the Treaty of Waitangi, were respected. There was no plan to focus on any one demographic of students, or achievement information, in the study. Rather my intention was to focus on the leadership actions associated with utilising assessment information in the decision making process. This may at times relate to priority learner information, such as Māori achievement, but that would be incidental to the purpose of the study, which intends to concentrate on the procedures involved, rather than the raw data. Therefore, at this point it is not expected to encounter any ethical issues related to the Treaty of Waitangi.

Due to the nature of my research forming part of an academic qualification, there was always external oversight of myself as a novice researcher in terms of ethics. This oversight and the checks and balances employed by the University, helped reduce the possibility of any ethical conflict. In addition to this, during the course of my research, all goals of the research were clearly indicated to all participants, in order to eliminate any chance of real or perceived deception. Prior to dissemination of my study, there will be an opportunity for member checking, to attempt to ensure that there is no data misrepresentation. Findings will be shared with those participants who indicated that they wished to be informed at the conclusion of the study, for as Burton and Bartlett (2009) maintain, this is an important principle of research. Cresswell (2008) took this statement further by saying:

As ethical educators we need to make every effort to communicate the practical significance of our research to the community of researchers and practitioners so the inquiry will be encouraged and used (p. 13).

The intent of the research is to produce an honest, and as much as possible an unbiased study, following the maxim 'do no harm'. I have endeavoured to follow all policies and procedures as set out by the University of Canterbury throughout the course of my study.

Chapter 4: Findings: Phase One - National Online Survey

4.1 Chapter Overview

The results of this study are presented in two chapters. The first of these chapters, chapter 4, focusses on the findings of my *national online survey* into how New Zealand secondary schools understand and utilise national qualification data for improving learning and achievement. The second of these chapters, chapter 5, presents the findings from the *descriptive multi case study* into three New Zealand High Schools use of data. The reason underlying this separation of results, notwithstanding the fact that the data stems from different methods of collection (survey vs semi-structured interview), is the desire to analyse sequentially. First the breadth of opinion related to a wide array of schools is considered, and then a more focussed, in-depth investigation of three purposively selected schools.

This chapter begins with a summary explanation of the structure of the survey undertaken. A more detailed description of the approach is recorded in the methodology chapter of this study. However, it is repeated briefly here to enable this chapter to be self-contained in its presentation of findings. The chapter then proceeds to an analysis of the responses to each survey question.

4.2 Survey Design

The results from my survey forms phase one of my data collection. The survey also provides background to inform the sampling method for phase two, case studies from three schools which is the focus of chapter 5. The survey contained ten separate questions categorised as the following, three demographic (quantitative), three attitudinal (quantitative/qualitative) and four descriptive (qualitative). The style of each is shown in the table below.

Table 6 *Data Collection*

Category	Data Type	Collection Method
Demographic	Quantitative	Drop down menu selection
Attitudinal	Quantitative	Semantic differential scale
	Qualitative	Comment box
Descriptive	Qualitative	Comment box

The first category, demographic data were collected in order to study any trends or patterns in the responses that may be directly accountable to the demographic in question. This possible relationship between variables was investigated by employing a chi-squared test. This is a test designed for assessing independence between variables when comparing groups (Kim, 2017). The presentation of this data also shows the range of representation of the respondents compared to the population in question.

The next category of question is related to attitudinal positioning of the respondent and required participants to rank their school in terms of importance, purpose, and confidence in data use for improving learning and achievement. Each of the three attitudinal quantitative questions had follow-up qualitative contextual descriptions resulting in mixed data types being collected. The third and last descriptive category includes four important aspects. These are description of data use, challenges faced, intentional actions taken to overcome challenges, and types of assistance and resources that are available to schools to help make optimum use of data for improving learning and achievement.

I now move to consider the responses from each question individually, according to the order of the categories listed above. This is not entirely in the same order as the survey was presented as I have chosen to elevate the attitudinal question relating to the importance of data use. This is placed ahead of the description of data use question so as to keep the quantitative categories together in the analysis. In the survey itself the question on the importance of data use was deliberately placed following the description question in the hope that the participant would reflect and reconcile how the data was being used with the value that was being placed upon it.

4.3 Analysis

4.3.1 Demographical data collected

At the beginning of the survey, all participants were asked three demographic questions about their school. The questions related to the school's type (e.g. state co-ed, independent girls, etc), socioeconomic status (e.g. decile rating²) and position in the school of the person completing the survey (e.g. principal, senior leader, etc). All three questions took the form of a drop-down selection style, where the participant could choose from a preselected menu which response best fit their situation.

Two main purposes underpinned the collection of this initial demographic data. The first purpose was to give context to the schools being sampled, as I was interested in knowing if there were any voices dominating the discussion in my study from groups or more importantly, establish whether any groups were missing altogether. The second purpose was to enable category branches to be followed for subsequent analysis of responses according to responder type.

The first demographic question related to which type of school the respondent was representing. There were nine possible responses. The frequencies recorded are shown in the table below along with the representative proportion percentage of the survey population. The greatest number of respondents were from state co-educational schools, which is to be expected as they form the greatest section in the survey population. All other categories were represented, with the exception of independent boys' schools. This is due to the fact that these two schools did not have email addresses supplied in the list compiled by the New Zealand Qualifications Authority (NZQA) of School Liaisons, which was how the survey population was determined.

² A decile rating of 1 is assigned to the 10% of schools with the highest proportion of students from low socioeconomic communities" (Meehan et al., 2019, p. 1132)

Table 7 *Type of school*

School Type	Frequency Respondents	Survey Population	Percentage Response Rate
State Co-Ed	32	217	15%
State Boys	4	15	27%
State Girls	2	17	12%
Integrated Co-Ed	6	33	18%
Integrated Boys	3	17	18%
Integrated Girls	5	26	19%
Independent Co-Ed	2	10	20%
Independent Boys	0	0	N/A
Independent Girls	2	6	33%
Total	56	341	

It is important to note that I did receive an email from a senior leader in a school who said that they could not participate in my survey due to their particular school type not being listed. The school identified as a Wharekura or Kura Kaupapa Māori (a state school where the instruction is not in English but te reo Māori (New Zealand's indigenous language)). My intention was to include these responses under the "State" heading. However, in hindsight I should have had an additional category for these total language immersion schools. This may mean that the survey does not include these important voices if other like schools made similar decisions namely, not to participate.

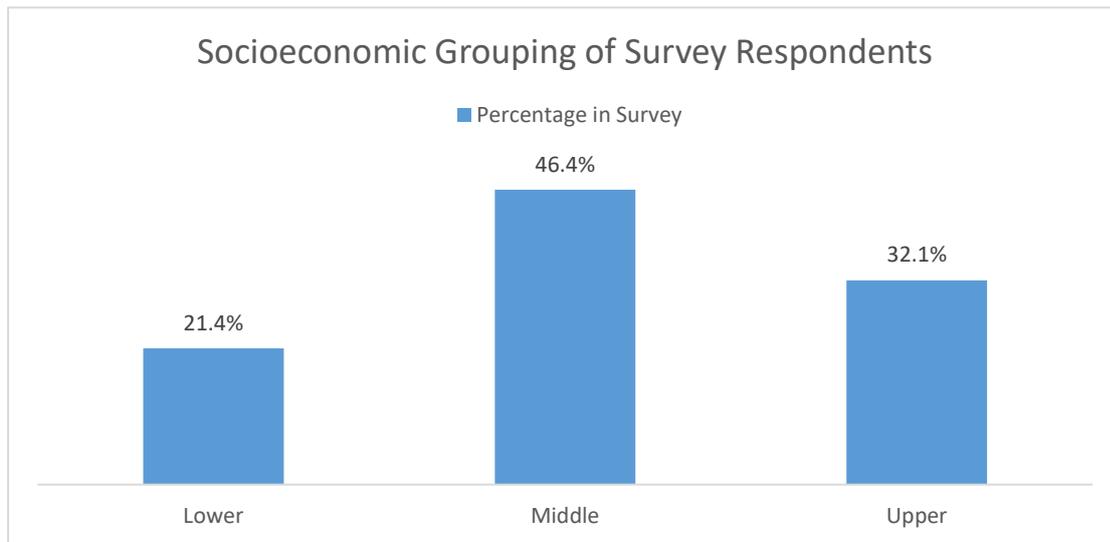
The second demographic collected related to the decile rank of the participating school. As can be seen by the frequency table below, the socioeconomic catchments vary amongst the survey respondents, with no survey respondents from decile 2 schools.

Table 8 *Decile Rank Frequency*

Decile Rank	Frequency Respondents	Survey Population	Percentage Response Rate
1	3	39	8%
2	0	36	0%
3	4	37	11%
4	5	38	13%
5	9	23	39%
6	10	42	24%
7	7	32	22%
8	4	33	12%
9	7	33	21%
10 and Independent	7	24	29%
99 (no decile rank)	0	4	0%
Total	56	341	

Given the lower numbers in my sample and the fact that I am more interested in a general terminology of lower, middle and upper socioeconomic status than individual decile ranks, I have chosen to group the decile ranks into three sections. ‘Lower’, encompassing decile ranks 1 through 4, ‘Middle’, including decile ranks 5 through 7, with the remaining ranks of 8 through 10 to be termed ‘Upper’. The percentage distribution of survey respondents in this grouping (displayed in Figure 2), show that the lower socioeconomic status schools have the least representation in the survey. Despite making up approximately one third of the sample population, the level of responses from the lower socioeconomic status schools as a percentage of all responses is only 21.4%.

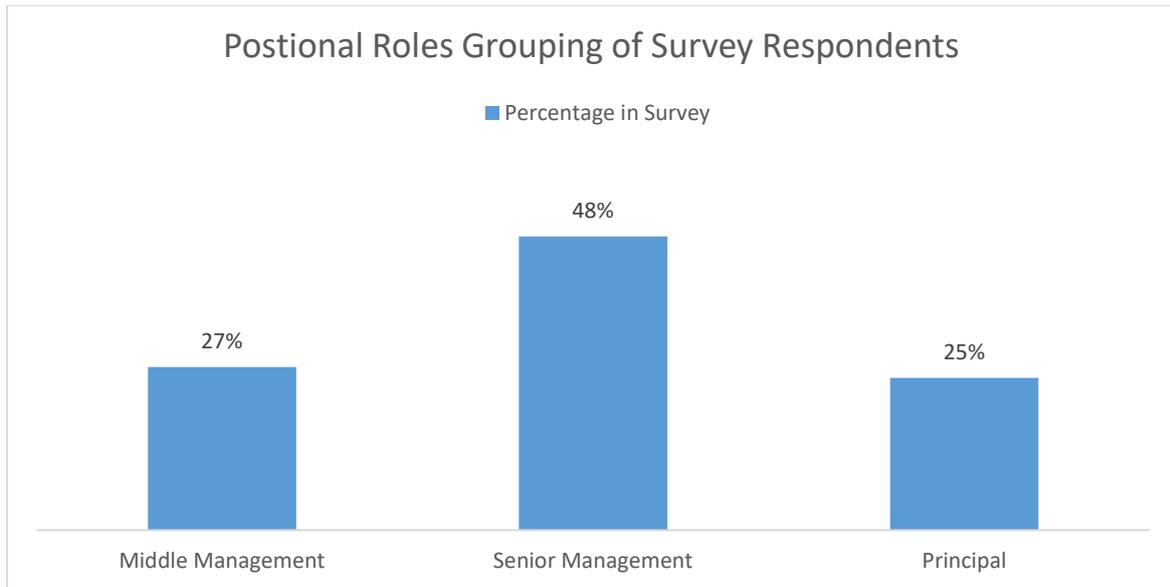
Figure 3 *Percentage of socioeconomic groups in the survey*



It would be of interest to investigate further if the lack of equal representativeness of socioeconomic status across the survey respondents reflected any underlying differences in ideology towards data use, or if this was merely a sampling variation. However, the possible causes of representativeness, or lack thereof, is outside the scope of this study. I am instead more interested in considering whether the broad socioeconomic rating of the school had any bearing upon the responses received from the survey. I will investigate this by applying a chi-squared test to the results grouped by decile ranking to analyse the possibility that the responses are dependent upon socioeconomic grouping.

The last item of demographic data collected related to the position in the school of the person filling out the survey. There were four possible options: principal (14 respondents), senior leader (27 responses), middle leader (15 Responses), and finally classroom teacher (0 responses).

Figure 4 *Positional roles and frequency*



It was not expected that any classroom teachers would be selected to fill out this survey by their schools, therefore having no responses in this category was not a surprise. The initial dissemination of the survey sent to the generic school email addresses asked for the survey to be passed on to the appropriate person in charge of assessment data in the school. In most cases, this person was in a position of senior authority, therefore it was not envisioned that a person with no such responsibility would complete the survey. In the second dissemination it was sent to the school NZQA liaison who also is typically a school leader.

Again, as with socioeconomic status mentioned above, a chi-squared test will be applied to analyse the possibility of dependence of responses to position held within the school.

Now that the representative breakdown of the survey responses has been established, I turn now to my first survey question on the importance of assessment data use.

4.3.2 *Importance of assessment data use*

Survey Question 1: Rate the level of importance that your school places on the use of assessment results for improving learning and achievement.

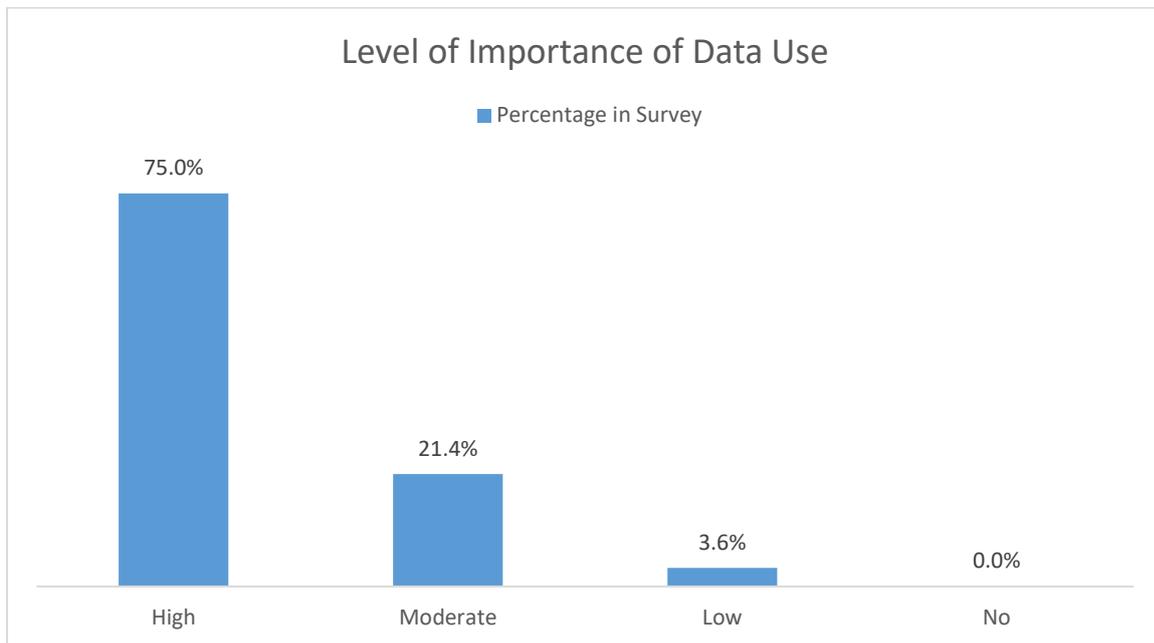
This question employed a semantic differential style response with four possible options: 'No', 'Low', 'Moderate' or 'High' level of importance. None of the schools responding to my survey, rated their school as placing no importance upon the use of assessment data.

However, as mentioned in the previous chapter, care must be taken here not to assign too

much weight to this result as the participation in the survey itself may have relied upon the relevance of the topic to the potential respondent. Those schools who felt that the use of assessment data did not impact on learning and achievement may have been less inclined to participate.

As can be seen from the following figure, most respondents (75%) considered the use of summative data for improving learning and achievement to be of high importance, with only 3.6% considering it of low importance.

Figure 5 *Level of importance and percentage*



A chi-squared test of independence was performed to examine the possible dependence between socioeconomic grouping ('Lower', 'Middle' and 'Upper') and the level of importance the school places on the use of results to improve learning and achievement. This test involves comparing the observed results with the results expected due to the socioeconomic group percentage weighting. The chi-squared test was then performed using the size of the differences between the observed and expected to determine if they were statistically significant (determined by having a "p" value less than .05). If the "p" value is greater than this, then there is said to be no statistically significant evidence that the two variables being compared are dependent upon each other. The table below shows the observed and expected results from the survey related to the respondents' levels of importance ranking followed by the final chi-squared parameters calculated.

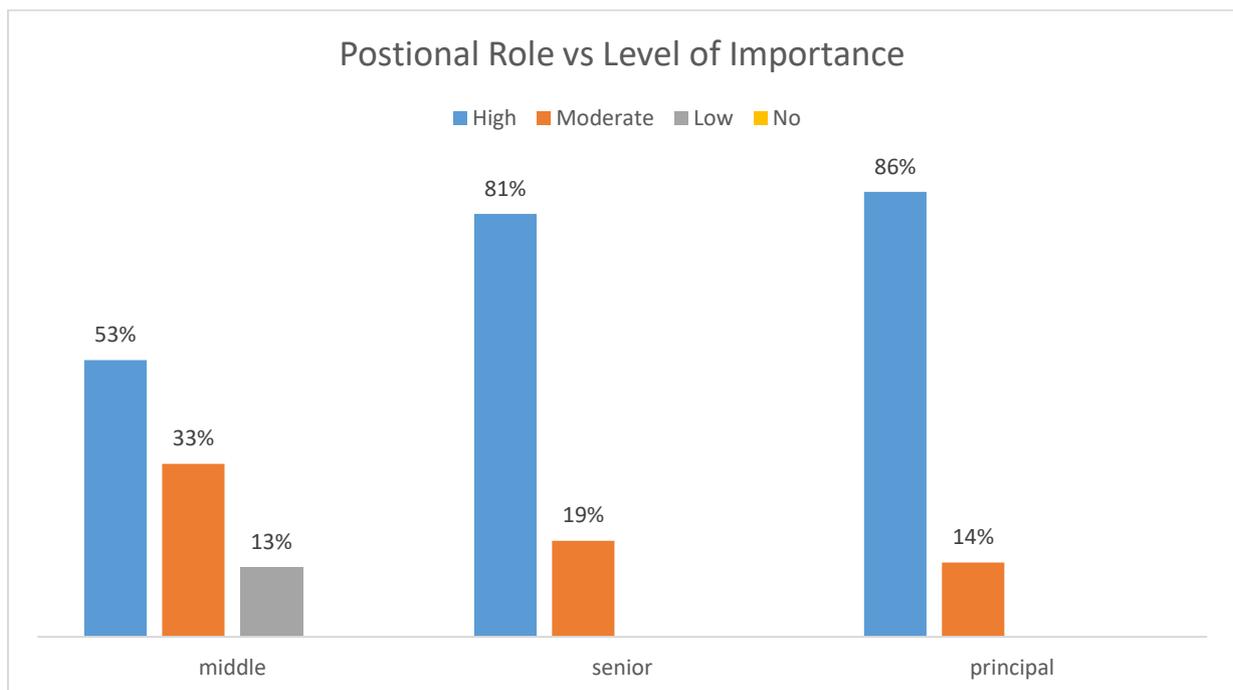
Table 9 Observed and expected level of importance by socioeconomic group

Socioeconomic group	High Observed	High Expected	Moderate Observed	Moderate Expected	Low Observed	Low Expected
Lower	7	9	5	3	0	0
Middle	19	20	5	6	2	1
Upper	16	14	2	4	0	1

The relation between the socioeconomic grouping and level of importance ranking by the respondents was found not to be significant (the “p” value being greater than .05), $\chi^2 (4, N = 56) = 6.47, p = .166$. Concluding that from the sample there was no statistical evidence for the socioeconomic group influencing the level of importance ranking that the respondent placed on the use of results to improve learning and achievement.

The level of importance in the sample schools did appear visually to decrease when looking at the position within the school the respondent held, with middle leaders being the only group to have some respondents (13%) considering data use to be of low importance for improving learning and achievement, as shown in the figure below.

Figure 6 Positional role and level of importance



Therefore, it was important to apply the chi-squared statistical test once again to investigate whether this seemingly dependent relationship was statistically significant. A table showing observed and expected results was again constructed and the chi-squared parameters calculated.

Table 10 *Observed and expected level of importance by socioeconomic group*

Position	High		Moderate		Low	
	Observed	Expected	Observed	Expected	Observed	Expected
Middle	8	11	5	3	2	1
Senior	22	20	5	6	0	1
Principal	12	11	2	3	0	1

The chi-squared test of independence parameters of, $\chi^2 (4, N = 56) = 8.20, p = .08$, showed that in this sample, position and level of importance cannot be said to be dependent. However, with the “p” value being so close to .05, and considering the size of the sample, it also raises caution for the assumption that position and level of importance are independent of each other in the population of all schools.

The reasoning that guided the decision behind why a respondent chose their particular rating of importance was unpacked. This is why it is appropriate here to combine the qualitative explanations of the responses to give context. The comments justifying respondents’ rankings of importance are now discussed in the order of the ranking selected, ‘*low importance*’, ‘*moderate importance*’, then finally ‘*high importance*’. The typed short answer qualitative comment box responses were first analysed to look for common themes or recurring statements. In doing this I was mindful of my own possible personal bias and therefore made a determined effort to let the data speak for itself by weaving direct quotes into the following description of the responses. The quotes are coded to reflect the position of the respondent, the socioeconomic group they belong to and include a number to identify individual respondents (e.g. SL4 – senior leader, lower socioeconomic grouping, 4th respondent in the category).

Only two respondents rated the use of assessment results for improving learning and achievement in their school as of ‘*low importance*’. They both held middle leadership

positions. The first respondent came from the initial dissemination of the survey (which did not target staff holding a specific role in the school) and stated that there was “very little actual discussion on use of results to improve teaching and learning”, and that the “results are often used for timetabling staff and for promotional work” (MM1). This response is from a staff member that the school had determined was the appropriate person in charge of assessment data use to respond to the survey. The second middle leader respondent who selected low importance explained their ranking by taking issue with the nature of the summative assessments themselves saying, “external standards are not standards based, being graded and manipulated to fit a predetermined profile of performance”. This respondent highlighted the opportunities represented by internal standard assessment “requiring not a single performance rather a serious exploration of learning and comprehension” (MM7). While both respondents considered data use to be of low importance, their specific underlying reasoning differed. One related the importance to how data are used, while the other took issue with the nature of external assessment in New Zealand.

Those respondents who selected ‘*moderate importance*’ for the use of results to improve teaching and learning tended to justify their response with comments such as “it is of importance but not the sole driver of achievement and success” (ML1) and “achievement through assessment is only one manner in which to judge achievement” (SL10) and “Learning opportunities and excursions are more valuable” (SL5). Several respondents, all middle leaders, raised the issue of how assessment results are typically portrayed in the community claiming, “it comes into picture due to media’s use of ‘league tables’ to compare schools” (MM8). Only one respondent, a principal, mentioned professional development in their response and then only indirectly, stating “results are used to alter teaching programmes and address teacher learning needs” (PL3).

The remaining category ranking of ‘*high importance*’ for the use of results to improve teaching and learning not only had the largest number of responses but also the greatest array of justifications. It was only when considering the demographic category branches that similar themes started to appear. The ‘Lower’ socioeconomic grouping of schools tended to define their ranking mostly from the student’s perspective, stating that the use of results helped with informing how to “meet student need” (SL2) and “fine tune curriculum” (SL1) for students. This was slightly different to the approach of the ‘Middle’ socioeconomic grouping of schools who tended to focus mostly on the teachers themselves “determining

changes that need to be made to teaching” (SM1). The ‘Upper’ socioeconomic group was the only group to reflect upon the perception of the results being “highly valued by student’s parents and the wider community” (PU2) and often mentioned the fact that they use results to “compare ourselves with other schools” (SU9). Several schools in this ‘Upper’ category stated that they were “focussed on excellence” (SU1) and that they used results so that “all students are carefully monitored to ensure they achieve as highly as they possibly can” (PU3).

When considering the ranking of high importance through the lens of the respondent’s position in the school, clear themes emerged. Middle leader respondents often mentioned “the setting of school and department goals” (MU4) and considering “ways to improve our strategies to assist students reaching their full potential” (MM4). However, in some cases the level of importance was linked more to the emphasis on external perception of results, with comments such as “senior leadership are very conscious of results and what this reflects to the community about the school itself” (MM3) and “our pass/endorsement rates are used to promote the school” (MM6). Senior leaders on the other hand tended to focus on the processes involved with terms such as “analyse”, “track” and “reflect” being common amongst the comments. One respondent noted that “each curriculum area within the school does a robust and thorough analysis of our NCEA results which then allows for further thinking and development of strategies to improve results” (SM10).

A trend was noticed in comments from principals who often utilised the terms “evaluate” and “measure”. This suggested their focus was about the outcome and the attempt to quantify “the effectiveness of the learning programme” (PM4). One principal emphasized the importance of results saying; “it is the major reason we exist – teaching and learning” (PU6).

To conclude, most respondents (96.4%) to the survey indicated that the use of assessment results for improving learning and achievement was of *moderate* or *high importance*. Neither the socioeconomic group of the school, nor the position of the respondent, were statistically shown to influence the level of importance ranking of assessment results for improving learning and achievement.

The second question in the survey related to the analysis of the purpose associated with schools’ use of data is the next question discussed.

4.3.3 Purpose of the use of assessment results

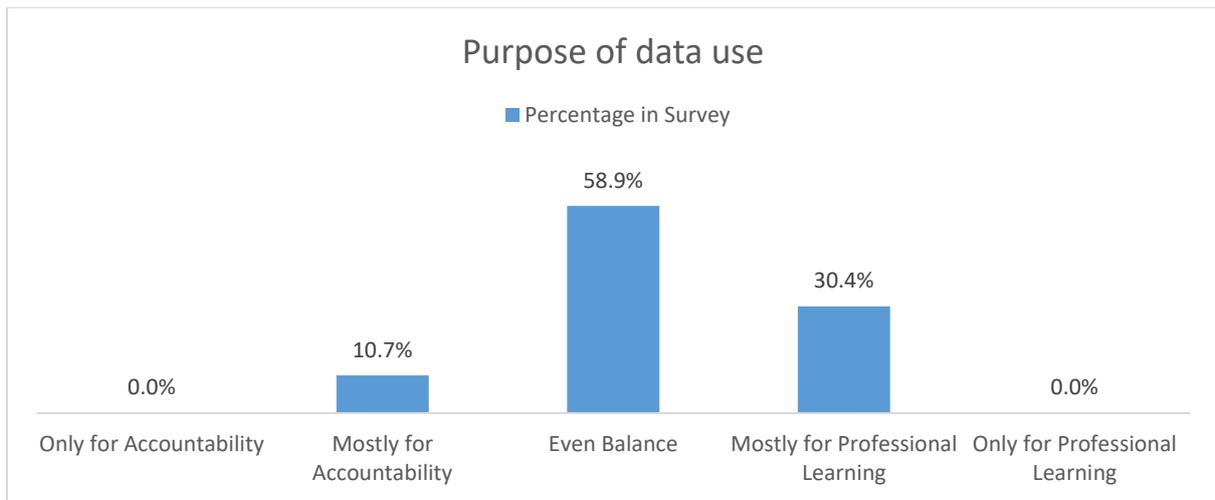
Survey Question 2: Tick the main purpose of your school's use of NCEA (Cambridge/IB) results.

This question again employed a semantic differential style response, only this time with five possible options: 'only for accountability', 'mostly for accountability', 'even balance between accountability and professional learning', 'mostly for professional learning' and 'only for professional learning'. In this case I felt that having a choice in the centre of the bipolar scale between 'only for accountability' and 'only for professional learning' was important to give the respondent the opportunity to place equal value on the two concepts of accountability and professional learning being explored. The assumption being made in this question is that it is possible to define the main purpose of assessment result use in schools as either being wholly for accountability or professional learning, or some graduated measure in between. This relied upon the respondents' understandings of the definition for the two key concepts (accountability and professional learning) which is why the qualitative comments describing the choice of rating are also important to include with this analysis.

Upon analysing the qualitative data accompanying this question it was noted that 15 respondents, from a range of socioeconomic groups and school positions, chose not to comment on their ratings. This may be a result of survey fatigue as there were also 12 respondents who did not respond to the qualitative description of the next question into their level of confidence of their schools' use of data. It might also have been partially due to the unintentional ambiguity in the question as can be seen from the following two comments: "Accountability? Is this student accountability to achieve the tasks or staff accountability to deliver the curriculum" and "I am uncertain what you mean by 'accountability'. Whose accountability, and to whom?" The questioning of which shows that the respondents are conscious of a range of forms of accountability operating in schools.

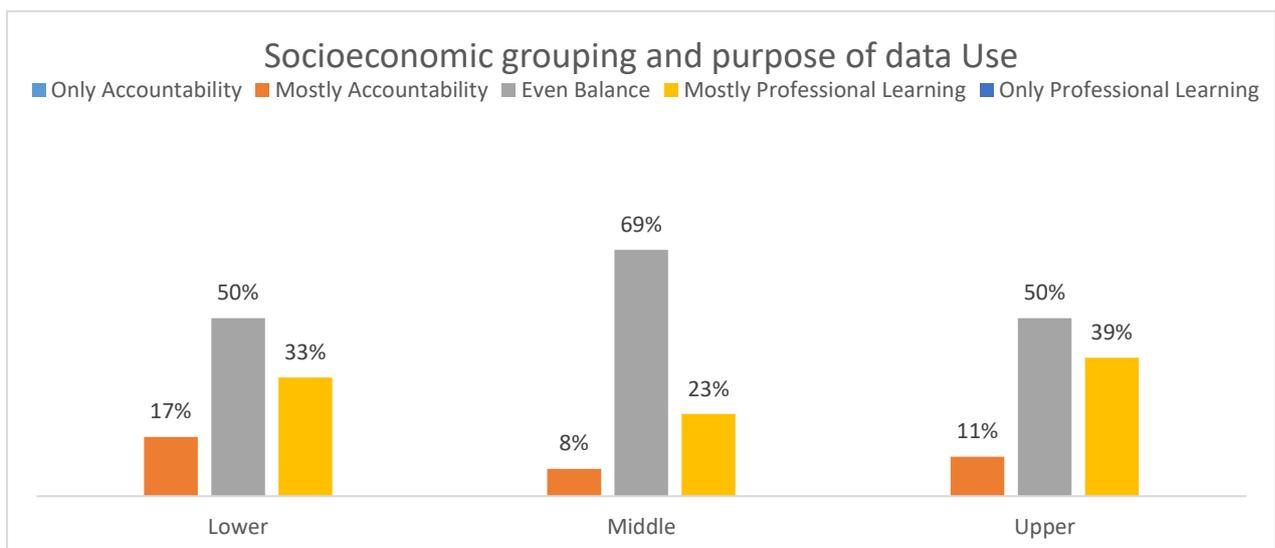
None of the respondents in the sample selected either extreme of 'only for accountability' or 'only for professional learning' in the semantic scale. This showed that all believed that the main purpose of using results for improving learning and achievement was some combination of both concepts. However, the respondents differed in the degree of emphasis that each concept had, with more leaning toward professional learning than accountability as shown in following Figure 6.

Figure 7 Purpose of data use and percentage



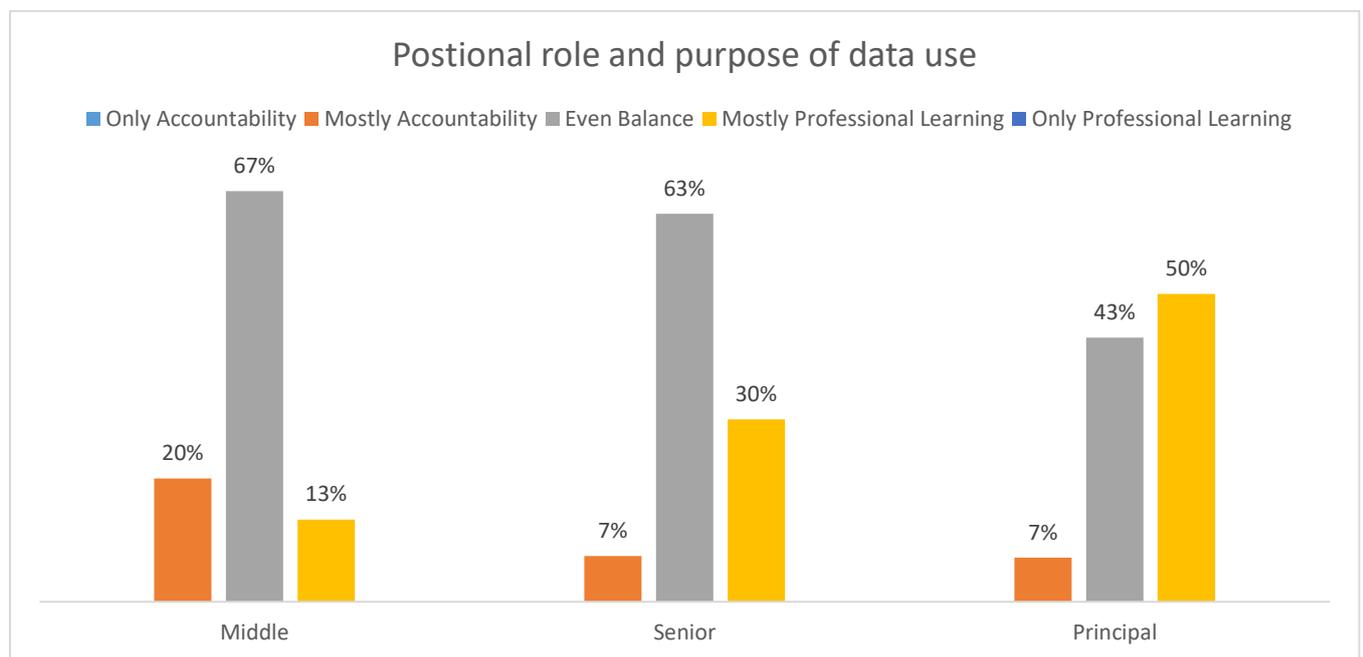
Looking at the distribution by socioeconomic grouping shown below in figure 7, there does not appear to be any difference to the way in which respondents answered this question. The chi-squared test of independence calculated parameters reinforces this with the “p” value being well above .05, $\chi^2 (4, N = 56) = 2.42, p = .65$. The process followed to determine these parameters are the same as in the preceding survey question analysis, with the comparison of the observed results against the results expected due to the socioeconomic group percentage weighting. I have chosen not to include the tabulated results and only include the chi-squared analysis parameters for the remainder of my study as doing so still reflects the level of independence.

Figure 8 Socioeconomic grouping and purpose of data use



When considering the position of the respondent in the sample, it appears from the sample that the more senior the position, the more likely they were to respond towards professional learning. Whereas the opposite trend is shown for accountability. However, care must be taken when making any general inferences to the population of all schools as the chi-squared test of independence reveals that it is not possible with these results to claim any statistically significant relationship between the options chosen and the position of the respondent, with again the “p” value being higher than .05, $\chi^2(4, N = 56) = 5.71, p = .222$.

Figure 9 *Positional role and purpose of data use*



It is important to consider here the explanations describing the respondents’ answers governing their choice of main purpose. The comments that were supplied will be approached by first considering the ‘mostly accountability’ option followed by ‘even balance’ and concluding with ‘mostly professional learning’.

For the comments accompanying the ‘*mostly accountability*’ choice, almost all mentioned “the connection between results and subsequent professional learning needs” (SU9). However, they placed the external expectations and reporting as “probably more important though” (SU9). One respondent lamented this pressure suggesting “students are now more than ever focussed on harvesting credits” and concluded “the sacrifice is real use of professional development for quality teaching and learning” (SL4). Common themes in the ‘*even balance*’ option comments were external pressures in the form of community expectation for school-wide achievement in relation passing rates for national qualifications,

and the needs of reporting. One respondent claimed “low results can translate into bad publicity and less enrolments. So, this adds an extra pressure” (SM1).

The use of the TAI model (Teaching as Inquiry) from the New Zealand Curriculum (Ministry of Education, 2007) was explicitly mentioned by several respondents when describing the purpose of the use of assessment results for professional development (PM3, SU1, SM2, SL2, MM2). A frequent comment concerned the difficulty in separating the two concepts of accountability and professional learning with one justifying their position as an ‘*even balance*’. One explained this by stating:

Both are necessary. Professional learning is important for school wide improvement. Accountability in of itself will not necessarily bring change to practice. The purpose of accountability is to fix areas of concern and acknowledge successes. They are inextricably linked (SU6).

The external and reporting pressures highlighted in the first two choices of ‘*mostly for accountability*’ and ‘*even balance*’ comments, are notably absent in the final choice ‘mostly professional learning’ of qualitative data. Instead, they explained “the main purpose of using results is to inform planning” (SM16) and that teachers are “responsible and should be focussed on improvement and therefore their own professional learning” (SU5). For this choice of ‘*mostly for professional learning*’, unlike the ‘*even balance*’ choice, no one mentioned the TAI model, or any type of inquiry method.

The responses to this question illustrated the difficulty that arises when explaining the main purpose of assessment result use when considered in terms of the concepts of accountability and professional learning. One principal described this dilemma in relation to their school as recorded below.

I consider the reflection staff do on the results of their students to be concerned primarily with professional learning, but I am sure many staff would view it as about accountability. We need to convince a team of very committed and high achieving staff that we ask them for the reflection and learning, to show they know what has happened for students and why and consider possible changes if needed. Unfortunately, many feel that the very question means they are seen as accountable and take this more seriously, and anxiously than I consider it to be (PU1).

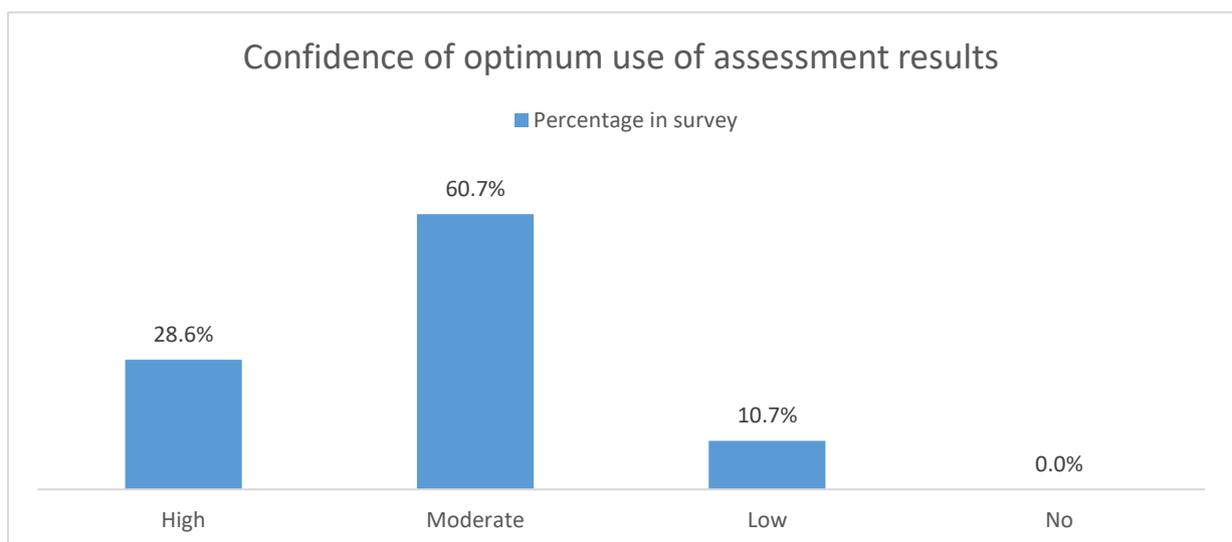
I turn now to the last question containing quantitative data in the survey. This is the question related to the relative confidence the respondent had that their school was making optimum use of assessment results for improving teaching and learning.

4.3.4 Confidence of optimum use of assessment results

Survey Question 4: Tick the level of confidence that you have that your school is making optimum use of assessment results for improving learning and achievement.

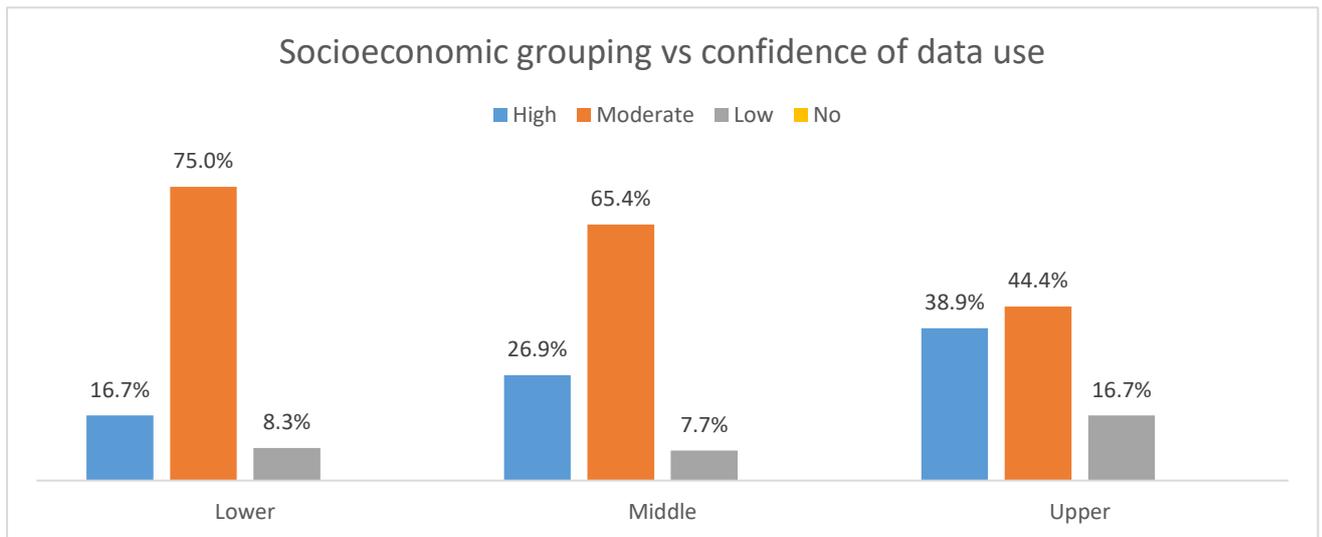
This question mirrored the quantitative approach of the first survey question in that it employed semantic differential style response with four possible options: ‘no’, ‘low’, ‘moderate’ or ‘high’ level of confidence in using assessment results for improving teaching and learning. As with the first question on importance, no one selected the lowest category of ‘no’, which is defined as meaning, having no confidence in the school’s use of assessment data. The vast majority, 89.3% had ‘moderate’ or ‘high’ confidence in their school making optimum use of assessment results as displayed in the figure below.

Figure 10 Level of confidence in data use and percentage



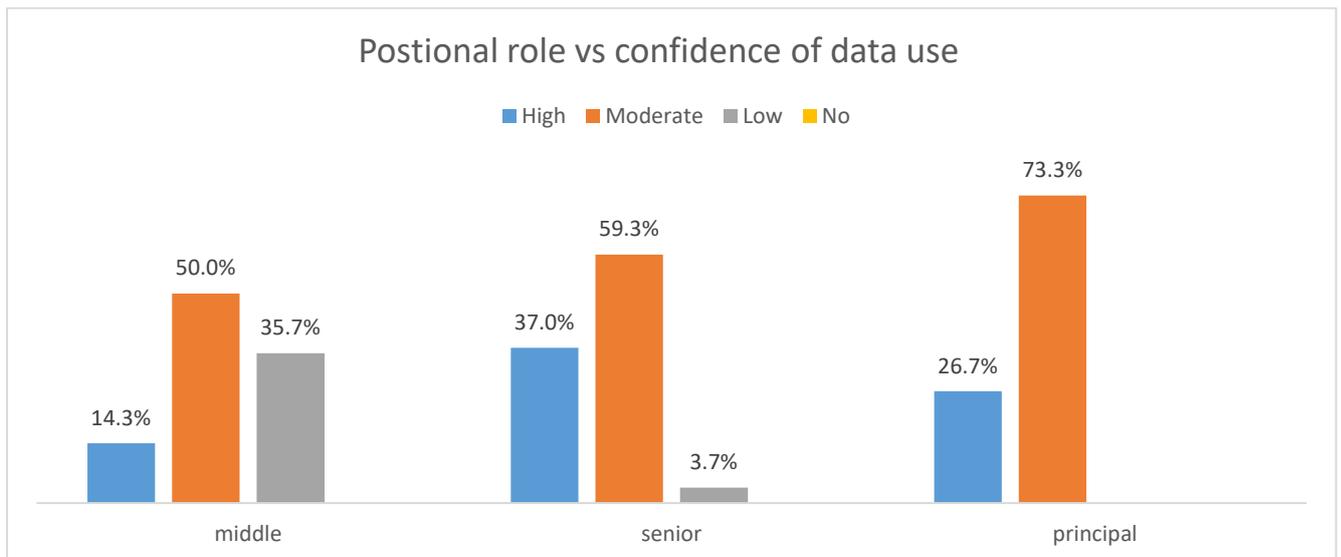
The responses to this question are now examined through the branching categories, first socioeconomic then positional role to see if the level of confidence ranking show signs of dependence on these categories. The socioeconomic data showed both visually in the following figure and by the chi-squared test for independence parameters, $\chi^2 (4, N = 56) = 3.45, p = .485$, that the level of confidence ranking was not influenced by socioeconomic grouping in this survey sample.

Figure 11 Socioeconomic grouping and confidence of data use



The level of confidence that the optimum use of assessment for improving learning and achievement ranking was seen in this sample to be dependent of the positional role that the respondent held within the school. This is shown by middle leaders having the lower levels of confidence and principals the highest. This was found by the chi-squared test of independence to be a statistically significant relationship between the level of confidence chosen and the position of the respondent, with the “p” value being lower the .05, $\chi^2 (4, N = 56) = 13.38, p = .009$.

Figure 12 Positional role and confidence of data use



The analysis of the qualitative descriptions of the rankings supplied by the respondents will now be presented. I will group these explanatory comments in the order of the ranking given, that being, 'low' confidence, 'moderate' confidence, then finally 'high' confidence.

The 'low' confidence category contained only one respondent from senior leaders with all the remaining respondents being from middle leaders. The interesting point here is that only one respondent in this entire group qualified their ranking with a comment. This one statement was short and simply said "we could do more" (MU3). Again, the matter here of possible survey fatigue must be raised, however, these same respondents had answered the next three qualitative questions with long comments so this would suggest the reason behind leaving this section blank does not appear to be related to fatigue.

Several themes appear when investigating the numerous comments from the respondents that chose the 'moderate' confidence ranking. The most common statement related to the inconsistencies within the school with "some departments doing a much better job than others" (SM1). This was further expanded upon by other respondents who said, "while it is the expectation that all staff use the results, we do not have any mechanism to ensure that it is happening" (SM16) and "the theory is there but can we be sure all teachers are following it?" (MU1). These comments again highlighting the "inextricably link" (SU6) between accountability and professional learning in the context of the use of NCEA assessment results to improve learning and achievement.

The next most common theme for respondents justifying their 'moderate' confidence ranking was the "low confidence in NCEA" (PU6). This was elaborated upon by one respondent who said, "as an experienced middle leader, I sometimes do not have complete confidence in the accurate marking/grading of NCEA materials" (MM3) and another who stated, "we are prepared to use the internals but are sceptical of the accuracy and worth of the externals" (MM7).

The final theme of inconsistency in capability, and the issue of time ran throughout many of the 'moderate' confidence ranking qualitative data is best summarised by the following comment from a respondent.

I feel confident that sufficient systems and processes are in place. However, capacity and capability are variable across the HoLA (Head of Learning Area) to manage and lead the improvement that is determined. Time allowance is another

issue for the forever increasing administrative demands on HoLA and all middle leaders (SL4).

Now turning to the *'high'* confidence ranking comments, most respondents who qualified their high confidence ranking came from the upper socioeconomic grouping. They placed emphasis on their *'high'* confidence as coming from their “high quality analytic tools that enabled a refined and dis-aggregated view of sections of our school easily” (SU6) and how their “school results are excellent which helps encourage confidence” (MU4). These respondents tended to elaborate upon their “associated practices” as being “strong and robust” (SU9). Often their justification of their high confidence was simply a description of the processes they followed, for example, “Data is analysed thoroughly, reviewed, reflected, shared with departments and discussed with SLT and used to inform annual goals. Department goals are aligned to school academic goal” (SU1).

The other socioeconomic groups that explain their *'high'* confidence level tended to do so in terms of the individuals involved, explicitly mentioning students and staff. They emphasized student goal setting and improving student outcomes. The respondents also mentioned “reflective curriculum conversations” (SL2) and praised their staff saying, “the majority of our staff are very experienced teachers who understand the NCEA Internal and External Standards well” (ML3).

In conclusion, most respondents (60.7%) had only *'moderate'* confidence that their school was making optimum use of NCEA assessment results to improve learning and achievement. Middle leaders had the lowest levels of confidence, and principals the highest. The middle leaders chose not to explain their reasoning behind their low levels of confidence that their school was making optimum use of NCEA assessment results for improving learning and achievement. The concepts and perceived conflict between accountability and professional development were indirectly referenced throughout the comments. Finally, there appeared to be a difference in perspective taken towards the use of NCEA assessment results when comparing the nature of the comments by socioeconomic group. The upper socioeconomic group tended to emphasize process and tools, in contrast to the other socioeconomic groups who accentuated the role of the individuals involved, that is, staff and students.

The descriptive, qualitative questions are now presented, by again scanning for themes and reporting if any of the branching demographic categories displayed any commonalities in their respective statements. As with the mixed data from the attitudinal questions above, I

have woven quotes that reflect common sentiment or that add important context to the discussion in order to place emphasis on the voice of the participants.

4.3.5 Description

Survey Question 3: Describe how your school uses assessment results for improving learning and achievement.

This question was the first long answer data text question in my survey, though of course respondents always had the option of justifying their quantitative question choices as discussed in the sections above. As can be seen by the survey question numbering in Appendix F, this was the third question in the survey and was positioned before the previously discussed question on the confidence of the optimum use of assessment results. This was deliberate so that respondents were asked to reflect upon their practice before rating the confidence they had in their school's optimum use of assessment results to improve learning and achievement. There was a 100% response rate for this question with the vast majority leaving long descriptions of the processes undertaken. There were no trends that seemed to occur that could be attributed to any of the branching categories that applied to the earlier survey questions.

In many responses the use of assessment results was considered as part of inquiry. "Teachers' inquiry into their practice and use of data to inform them about the next step to take to improve achievement" (PL1). The expectation was for teachers to "report, review, reflect and inform next steps for professional learning" (SU1). This was to be accomplished by comparing "against similar schools and looking at trends over time for variation and issues e.g. low achievement in specific standards" (PU2). As a result, programmes were "to be reviewed and refined in response" (PU1). This could well mean "there may be standards that need a different context, or longer learning etc" (PU1). Some respondents elaborated recommending the importance of considerations such as "the balance of internal to external assessment, number of credits offered and the positioning of assessment against internally assessed standards in school calendar" (SU2).

A further recommendation related to the strategies to inform the following year, "final data is analysed at the end of the year to inform learning in the next year and to ensure that there is relevant PD to address gaps" (PM3). One respondent concluded that "assuming that this is being done effectively this should cyclically improve results" (SM2). In contrast, concern was

raised by another respondent that such a culture of continuous reflection and review might lead to a situation where “if results are poor in an achievement standard a department might not do that standard again, rather than try and improve results in that standard” (MM1).

A different perspective shared by a few respondents was to see the use of assessment results “as a basis for determining students individual learning programmes” (PU3). This would be where “NCEA results are used in discussion with students whilst setting Individual Learning Plans” (PM2). The intent would be to “identify students who will struggle without extra support, to encourage high achievement (endorsement) through the year, to combine with student voice and teacher observation to make changes to current or future programs” (MM2). This inclusion of the student focussed upon “looking at individual achievement” to ensure “it meets with student and whanau expectations” (ML1).

One middle leader respondent expressed some frustration stating, “there is growing expectation that changes to teaching practice will solve all the under-achievement and behaviour management issues being faced” (MM8). This highlights the need to see the use of assessment results as merely one aspect of the broader picture of improving learning and achievement in a school.

There were no clear trends or themes that emerged when considering the respondents’ statements in terms of their demographic descriptions. The comments were also compared and categorised according to the respondents’ other quantitative survey selections for example, level of importance or confidence. Again, no clear pattern could be established between the variables selected. This was a little surprising as I had expected at least some differences to become apparent between the contrasting levels of low and high confidence in the descriptions of how assessment results are used within schools. The desire to further explore the concept of how the confidence level may affect data use for improving learning and achievement in schools helps form one aspect of the selection of case study schools, as detailed in chapter 5.

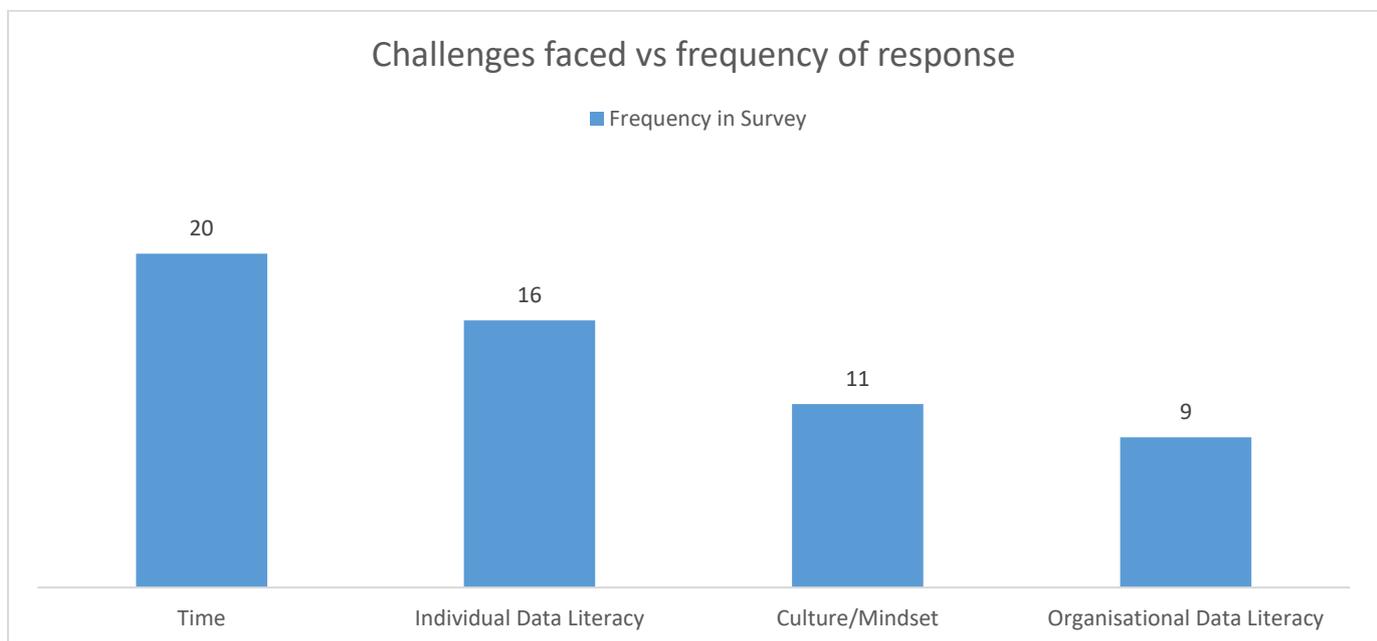
I now turn to analysing the survey question centred around challenges associated with data use.

4.3.6 Challenges faced in making use of data

Survey Question 5: List the main challenges that schools face in making optimum use of assessment results for improving learning and achievement.

This question was placed after the question referencing the level of confidence the respondent had towards the optimum use of assessment results. By using this question sequence, it was hoped that initial rankings of the confidence level would bring to mind any barriers encountered in making use of data. Only one respondent in the entire survey took a positive note for this question item stating, “I don't see any major challenges; teachers have access to the results early and can develop sound understanding of their results and plan accordingly” (SM10). This response points out the assumption in the question itself – that there are challenges that need to be overcome and as the response clearly demonstrates not all believe that to be the case. All other respondents listed multiple challenges. These are now presented as broad themes. The frequency by which they have been mentioned by respondents is shown in Figure 12 below.

Figure 13 Challenges faced and frequency of response



An explanation of the determination of these themes is now described, including quotes from the respondents to give context to the presentation.

The leading challenge that respondents felt impacted their ability to make optimum use of assessment results was the issue of “having time to analyse data thoughtfully, thoroughly and mindfully in order to distil a narrative of what has occurred” (MM3). A recurring response seemed to suggest schools, teachers and middle leaders in particular, the key group to whom this task usually falls, are very time poor (MM3, PM1, SM1, MM1, PL1, PM2, SU1, SL1, SL2, SM4, PU8, PM4, SL3, SM9, MU3, MM6, SM11, ML3, SM13, SL10). A consequence of this was about staff not having time to “have in depth open to learning conversations” (SL2). One comment stated that while this was a “continual challenge, it will not change”. They went on to say the “school does need to ensure it prioritises reflective action” (SU6). However, their response did not address how to accomplish this in “the undoubted pace of life in a NZ secondary school” (SU6).

The next highest frequency of challenge made mention of the lack of individual data literacy throughout the school. Comments referred to a “lack of expertise in exploring the data” (SM13). It was noted that even when the relevant data had been provided “staff lack skills in interpreting it” (SU6). One respondent highlighted the importance of having a lead person in the school, and someone “who is supported by other senior managers when it comes to monitoring of the subsequent actions of HODs and their staff” (SU9).

The culture that exists in education towards the use of NCEA assessment information was the third largest challenge described by respondents. The comments here tended to fall into two broad categories, external accountability, and internal accountability. The external accountability related to the use of assessment results by schools within their communities. This was described as situations where “schools use the results to compete in a competitive environment” (ML2). The consequence of the existence of this type of competitiveness meant, “it ceases to be about the students and becomes all about the reputation of the school” (ML2). This was felt to cause some reporting to communities to be “very skewed” (MM5). With diversity encouraged in the New Zealand school system, the ability to have genuine comparison was questioned, “you are not comparing apples with apples” (MM6). This has led to the situation where “league tables and pressure place emphasis on achieving levels rather than learning and opportunities” (ML1). The problem as one respondent described, was “not the results themselves, rather it is the system of teaching and assessment” (SM7).

This leads to the second category of cultural challenge, that of internal accountability. Respondents mentioned a “fear of being judged” (SL3) and “teacher resistance to being held

accountable” (PL3). One principal stated that there needed to be a change in “mindset, with staff feeling that they are responsible for the achievement of students and using the data to improve their practice” (PL1). Staff needed to take ownership and be reflective, “accepting the need for change” (SM2). However, the challenge was that staff “can see it as too hard” (SM2). There is hope though, as one principal reflected “but the culture is changing as professional development is provided” (PL3). Ultimately it is about “getting the balance correct between nerdy stats tracking and coding and the powerful human being interactions that drive learning and change” (SU3).

The last theme the challenge responses portrayed related to the physical resourcing of data use in schools. A strong thread throughout the comments intimated “data is not particularly easy to pull off the student management system” (PM3). Some of the reasons given for this were “complexity and volume of the data” and the lack of “simple tools to identify trends and correlations” (PU8). More than one respondent noted the need for “ease of access of data in formats that we can use from the SMS” (MM2), suggesting this was critical for optimum use of NCEA assessment information.

With the challenges and obstacles now firmly in the forefront of the respondents’ minds the survey then asked how these could be overcome through deliberate actions that schools took. Their responses are presented next.

4.3.7 Actions taken to help data use

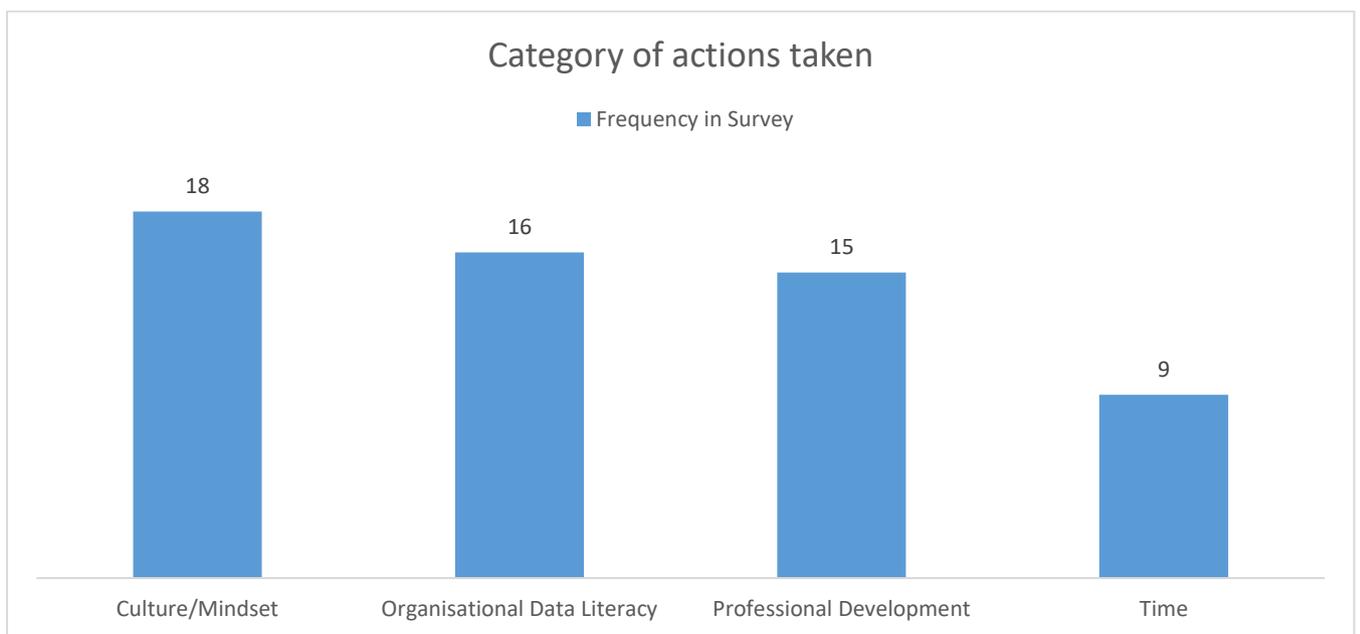
Survey Question 6: List the main actions that schools can take to help make optimum use of assessment results for improving learning and achievement.

This question was unintentionally ambiguous as highlighted by a few of the responses received. The intention was to focus on how to assist staff to be in a better position to be able to make optimum use of assessment results. However, a small number of respondents interpreted it to mean describing again processes used with students. For example, mentioning identifying and tracking at risk students (PU5). In hindsight a question better targeted to elicit the desired responses would have explicitly mentioned the word ‘staff’. The question could have been worded, “List the main actions that schools can take to help staff make optimum use of assessment results for improving learning and achievement”.

Thankfully, most respondents did interpret it as intended and the description of the themes found follows.

The qualitative data relating to this question contained only two responses that did not list or describe any actions. The first response stated “[I have] no idea - have never had any PD on how to look at data and then use that as a tool for planning etc. We tend to just go 'oh yes, that's about what we expected from this cohort' and then move on” (MU2). Another simply said, “I think the system is broken” (ML2) and finished the comment there. The remaining respondents commented on actions that could be taken to make optimum use of assessment results for learning and achievement. The grouping of these comments seems to fit mostly with the themes established in the previous question. This could be a result of my own unconscious bias in interpretation or because the respondents were reflecting upon the earlier descriptions of the challenges faced. However, the frequency of the occurring themes is notably different with Time moving from the most, to the least commonly mentioned theme.

Figure 14 *Categories of actions taken and frequency of response*



An explanation of the determination of these themes is now described, including quotes from the respondents to give context to the presentation.

The greatest number of responses discussed the importance of addressing the culture or mindset present in the school to make optimum use of data. The need to instil a culture of review “leading to “meaningful conversations, evidenced based, encouraging teachers to reflect on the courses they teach” (SL2) was vital to many (SU3, SM5, SM2, SM7, SU6, S9). However, as one principal commented this had to be done carefully in order to “make data

analysis less about accountability and more about improvement so that individuals are less defensive and more open to identifying trends and issues” (PU8). Two respondents began their description of action detailing staff culture and mindset development with the need to create a “trusting environment” (SL3) where they were “honest with staff” (PM1). This idea was further developed by others who mentioned the need to “reduce the fear of failure inherent in a system that has an accountability element” (MM3). The final action mentioned relating to culture and mindset was simply to prioritise the use of data as a valid and important thing to do (PL1, MM1).

Actions relating to the data itself was the next most common occurring theme throughout the qualitative comments. Respondents talked about making the large amount of data available more manageable (PM1, SM1). Simplicity and efficient access were stated as key to making the optimum use of data (SM4, SL1), as was the manipulation of the data, with the ability to aggregate and compare historical data (PL3, SU5). Other comments mentioned improving the use of the school’s SMS (student management system) or additional data analysis tools (PM4, MM2, SU6, SM12). One respondent discussed the action of providing all the data analysis completed for staff to review (SM8).

The comments that have been grouped under the heading of professional development related to statements about the need for, or the provision of, professional development to staff about the use of assessment data. This took two different forms, one relating to individual data literacy needs and the other and equally important was providing “PD on how to have [open to learning] conversations” (SL2). Always with the “focus on the narrative behind the results” (PU2) or as another put it “look at the stories behind the results” (SM11). The desired outcome was to have “targeted teaching as a result of data findings” (PU3). However, respondents stated that this could only occur if “staff were given time to self-reflect” (SL2) leading to the final main theme occurring throughout the comments being time.

The action involving the providing of time to staff was explicitly mentioned by many (MM3, PM1, SM1, SU1, SL2, SL3, MU3, MU4, SU9). The number of respondents here is lower than those who mentioned time as challenge in the previous question. This may be for the same reason that MM6 answered this question with “see response to Q5”. That being, they felt that this action was self-evident from their early response. Two others, namely MU4 and SU9 did not explicitly state in the previous question that time was a challenge. However, in answering question seven both described the need for staff to have sufficient time. Both respondents did

mention difficulties in accessing and interpreting data, and the need for time being allocated to specific staff. This is where SU9 talked about “appointing the right personnel for this task and resourcing them accordingly (time, space, opportunity...)” and MU4 lamenting “but schools cannot afford to do this”.

The final action raised in the data was the importance of “communicating in a timely and useful fashion with all stakeholders” (SM9). Highlighting the multifaceted lens through which reported assessment results may be viewed. This comment did not indicate who “all stakeholders” were, or the ways and means undertaken to communicate.

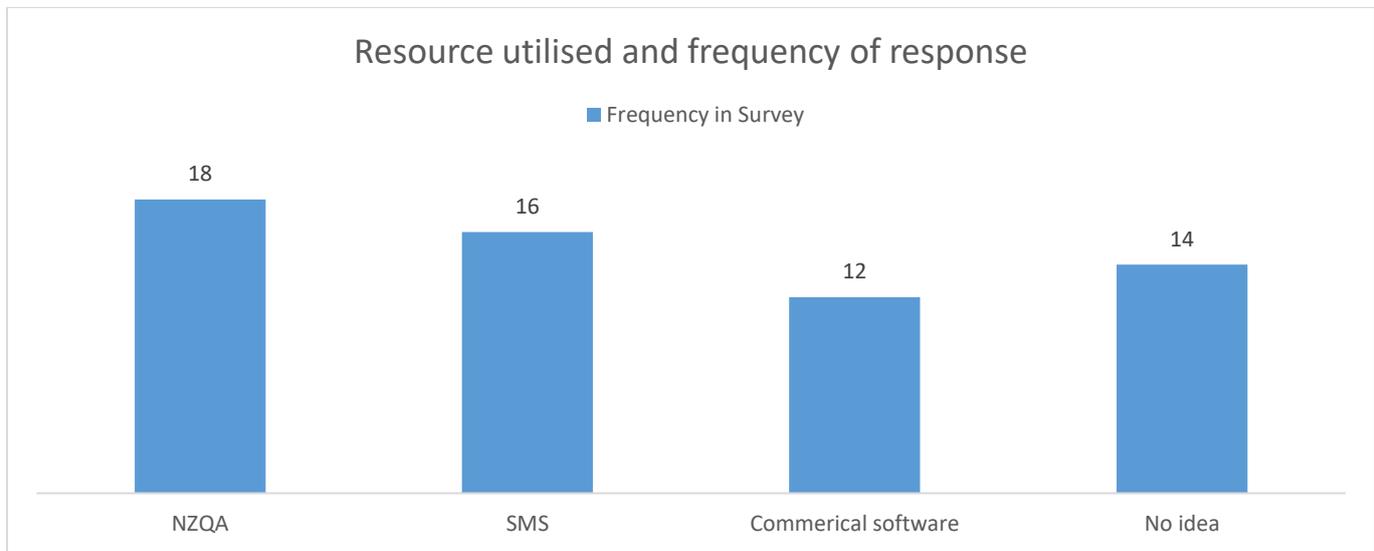
The last question in the survey involves the investigation into what resources and help respondents are aware that are available to them to help use assessment results.

4.3.8 Resourcing available to help with data use

Survey Question 7: List any assistance or resources that you know are available to help schools use assessment results for improving learning and achievement.

This is the closing question of the survey and was asked to gauge a sense of where schools were turning for help and assistance in their use of assessment results. A quarter of all respondents could not list any forms of assistance or resources available to help them. These respondents answered this question with comments such as “I’d be keen to know any answers to this question” (SL10) and “would love to know” (SM7). The remaining responses can be grouped into three main sources of assistance or resource. That being, NZQA, SMS (the student management system e.g. KAMAR/ MUSAC), or commercial provided software. The frequency of each category is shown in the figure below. Note: a single respondent could list more than one category.

Figure 15 Resource utilised and frequency of response



In the last category of commercial software three companies were explicitly mentioned. These were ‘Assay3’ (N=5), ‘On Your Marks’ (N=5), and ‘Ed Potential’ (N=2). The opinions on the suitability of employing outside help was mixed amongst the respondents. In some cases, they felt it was “one of the best resources we use are the services provided by outside providers to provide manageable data at the school wide level, and also at the department/standard level” (PM1). This contrasted with others who believed that “external providers are rarely useful as they don’t know the school context” (PU2). SL1 concluding that though “there are private providers who claim to be able to do it all, a private provider would probably not be worth the expense”. Two more reasons given for not employing commercially available programs were that they were “not substantial enough” (PU7) and that “the technical level required (of staff) has been problematic” (SM10).

Respondents to the survey argue that “the school SMS systems are getting better every year in providing good data, easily” (SL1). They state that they are doing “considerable analysis using our SMS” (MU1) and that there are constantly “new tools to assist with analysing data” (SM4).

NZQA is mentioned in the greatest number of comments as a resource, this is to be expected though as it is the source of all externally assessed results. Although some accused NZQA of not doing enough and leaving them alone “to do a lot of number crunching” (SM7) others stated that “NZQA has improved immensely in recent years in the quality and usefulness of the data they provide” (SL1).

4.4 Summary of the chapter

This survey was undertaken in order to provide insights into how New Zealand secondary schools understand and utilise national qualification data for improving learning and achievement. The results of the survey showed that clear value was being placed upon data use in secondary schools with 96.4% of respondents rating this of moderate to high importance. However, the main purpose of data use in contrast, did not have an obvious consensus. All responses stated that the purpose was a mixture of accountability and professional learning but with differing emphasis. Conflict and ambiguity between these approaches were highlighted by comments right throughout the survey.

Confidence that a school was making optimum use of assessment data was only high in just over a quarter of responses, demonstrating that the majority thought that there was room for improvement in this area. It is interesting to note that there was no perceptual difference in overall description of data use between those of differing confidence levels. This suggests the judgement of the level of confidence was highly subjective and not necessarily related to the particular processes followed. The confidence level seemed to be more of a reflection of the complex context in which it was being undertaken.

My two main research sub questions were also investigated in through this survey.

Sub question 1: What are the challenges that school leaders encounter in gaining insight into NCEA assessment information?

Sub question 2: What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

The greatest challenge highlighted was the lack of time available to undertake tasks. Yet in so saying, time was the least rated action, leading to the obvious question if it is the greatest challenge why is it not the most common action undertaken? One respondent as mentioned earlier in the chapter answered this by simply stating “schools cannot afford to do this” (MU4).

Respondents tended to answer the question regarding leadership actions taken, more with a description of the desired outcomes rather than any specific intentional actions. For example, creating a trusting culture was considered important but no explanation as to how they went about achieving it was given. Another aspect that appeared to be missing in all the discussion

was what type of targeted assistance related to interpretation of assessment information was given and how this was used to frame professional development? The only vague reference to this was in the passing comment about eliciting “the help of stats teachers” (SU3) within the school.

The results of the survey showed that while some schools appeared to follow similar processes with their assessment information their perceptions of purpose, importance and confidence varied. This is why I decided to undertake a case study approach (*phase two* of data collection) investigating assessment information use in schools in order to explore this notion in more depth. The findings of which are presented in the next chapter.

Chapter 5: Findings: Phase Two - Case Study

5.1 Chapter Overview

The previous chapter's discussion of the findings from a *national online survey* provided a broad insight into NCEA assessment results' use in schools for improving learning and achievement. This chapter now employs a *descriptive multi case study* approach (see explanation in Chapter 3). Data have been sourced from three schools to explore the phenomenon of the use of NCEA assessment information for improving learning in relation to each school case. This chapter is about the *thick description* (also described in the Methodology chapter), which offers a deep, dense, detailed account of problematic experiences, capturing and representing the meanings of actions of the research participants of this qualitative study. Included in this description, are interpretations, as seen through the lens of the researcher, where there might be different ways of understanding the phenomenon.

The three cases each represent a school with three research participants for each case. The roles of the three participants chosen to represent each case, were a middle leader (coded MM; typically a head of department, selected by the principal as a good representative of someone who effectively implements school data use policy), a senior leader (coded SM; usually a deputy or assistant principal, selected by the principal as the senior leader with the responsibility of oversight of NCEA data use in the school) and the principal (coded P). As part of the selection criteria, each case was differentiated by its specific demographic, coupled with the school's self-reported level of confidence in NCEA assessment information use as recorded in the online survey. For all three of the schools chosen as cases, NCEA assessment information use was seen as a '*high priority*', yet the schools' survey respondents reported differing levels of confidence in the use of data in the school, ranging from '*high*' to '*moderate*' to '*low*' confidence.

This chapter is structured such that each of the three cases is featured separately. This allows for thick descriptions of the views and actions of those focussing on NCEA assessment information use at each school to be understood inside the opportunities, challenges, and ways of working in each workplace culture. Hallinger (2011) argues, that contextual knowledge and uniqueness is an important dimension to consider in understanding leadership for learning.

The thick descriptions are distilled from semi-structured face to face interviews carried out in each school (see Appendix C for the interview questions). These interview questions were sent to the participants prior to their interviews so that they could consider their responses in advance. Recognition of individual participants' experiences, and expertise, as they described their understandings and perspectives, was deemed to be necessary. Therefore, where a description refers to a direct quote, it is attributed by coding with an abbreviation according to the position of the person making the quote. This is further able to be delineated by adding a suffix of A, B, or C to each code to represent the case in question.

The foci for analysis and presentation of the cases directly reflect my two research sub questions. I repeat these questions again here to enable this chapter to be read in isolation, and to provide a reminder of the main purpose of this thesis.

Sub question 1: What are the challenges that school leaders encounter in gaining insight into NCEA assessment information?

Sub question 2: What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

The thick description focused upon leadership actions taken and the possible challenges encountered in relation to the phenomenon of use of NCEA assessment information. Consequently, the description is presented under four main headings of setting the scene, challenges, leadership actions taken to overcome challenges, and concludes with insights gained.

I now turn to the description of the phenomenon of NCEA assessment information use in New Zealand schools in each of the three cases separately under the afore mentioned headings, starting with Case Study A: School Tahī.

5.2 Case Study A: School "Tahī"

5.2.1 Setting the scene

The context which situates School Tahī is of a rural school servicing a medium to high socio-economic population. The participants from this school described their level of confidence of making optimum use of NCEA assessment information for improving learning and achievement as, '*low*'.

Importance and purpose

At School Tahī NCEA assessment information was deemed as a crucial piece of evidence upon which to base decisions, that not just the senior leaders have to make, but filtering through all layers of the school community, through departments, to the directions that classroom teachers take, and the choices students make. SMA explained how this evidence-based decision making process removes the subjectivity when people rely purely on “gut feelings”. One of the key purposes of School Tahī’s use of summative NCEA assessment data is to create goals and targets for the following year. Such data are viewed as a predictor or baseline by which future achievement can be measured against. This is done through an analysis of historical trends and patterns in order to establish future expectations. However as (MMA) pointed out, “What NCEA data does not show, is what was the cause for students who did not achieve NCEA”. This comment highlights the need to look deeper, to investigate specific reasons for students not achieving, necessitating changes and modifications to programmes of learning. All participants’ comments reflected a shared view about evidence needed to make improvements to teaching and learning.

The principal emphasized that ultimately it is more about the individual student’s achievement, as measured against expectation, and not necessarily the cohort, which are of interest. This expectation was more than a numerical calculation but informed by the skills and aspirations of the student in question. That measurement answers questions such as: “how have things gone (in the individual’s journey towards a specific pathway)? Can we (the school) do something better for them? Can we (the school) support them in another way?” (PA).

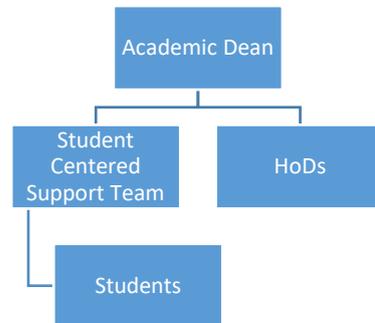
Analysing NCEA assessment information in such detail is difficult and as the principal conceded it, “creates a whole lot more questions”. However, the principal was encouraged and believed it has made the school “become far more reflective of practice” and has led to some “quite significant changes”. The principal elaborated further making special mention of changes to the school’s leadership structure that has been implemented. This structure is described in the next section.

The structure and processes, as they pertain to the use of NCEA assessment information in School Tahī, are now described.

Structure and processes utilised

The overall structure of the levels of responsibility in relation to NCEA assessment information use in School Tahī is shown in the figure below.

Figure 16 *Leadership Structure in relation to assessment information use in School Tahī*



Although the principal and the deputy principal have oversight for the process of NCEA assessment information use in School Tahī, the actual leadership responsibilities to carry out the process have been delegated to an academic dean (see Figure 15). As PA put it, “I get my academic dean to lead it to be honest.” This is one of the “quite significant changes” to which the principal of School Tahī had referred, namely the creation of a specific leadership structure to oversee the process of NCEA assessment information use. A named position entitled, ‘Academic Dean’, had been established, with dedicated time allowance and remuneration. The sole purpose of the position was stated as enabling an explicit focus on NCEA data and tracking students’ achievement. The responsibilities of the academic dean do not encompass numerical data analysis but rather mostly interpretation and reflection. The “number crunching” (converting the data into a format able to be interpreted) is contracted out to an independent company. The academic dean then helps, not only heads of departments, but also students (and sometimes parents), gain meaning and understanding from the data presented. How this is achieved is described in the next section.

The second “significant change” that School Tahī implemented, was the establishment of an additional leadership team structure involved with the use of NCEA assessment information; referred to as the Student-Centred Support Team (see Figure 15). It consists of the academic dean working in conjunction with the deputy principal and the relevant heads of Pastoral and Careers in the school. This enables the NCEA assessment information to be placed in the context of the overall needs and aspirations of the individual student. MMA describes this Student Centered Support team approach as one which,

individualises some of the results we are getting. It looks specifically at students and therefore, looking at their abilities, looking at the results from NCEA we might cater for quite an independent programme for them which may come in the form of things like foundation skills for the coming year.

Now that the leadership structure has been described, the process of NCEA assessment information use undertaken by School Tahī will be discussed. This process will be viewed through a conceptual framework lens, based upon the “Data to Information to Knowledge to Wisdom” or as more commonly referred to, the DIKW hierarchy (Aven, 2013). This framework, (see Chapter two), provides a systematic way in which to view the process of data use throughout an organisation. I delineate the framework taking its components in turn, namely creating information through analysis, and sense making.

Creating information through analysis

The very first step in the process of using NCEA assessment information in School Tahī is initial data analysis of whole school data. As the school does not have the technical ability (organisational literacy) or time in house to achieve all this, an external company is contracted to carry out this analysis. Aggregation in terms of ethnicity, gender and year level is compared to previous year’s data. Patterns and trends are highlighted and calculations of things such as GPAs (grade point averages), top 20’s, and priority students are carried out. This means that by day one of school a range of data analysis is ready to be shared with heads of departments. The next step is for department heads to use their own individual department data and carry out a further analysis. Just how the heads gain access to this data appears to vary across departments, with some simply going to the school’s SMS (Student Management System – in this case Kamar) to extract data from there (for an example see Appendix B). Other department heads would rely solely upon the senior leaders to provide all the data for them. This, according to SMA, was due to the lack of both organisational data literacy (systems and technical skills), and individual data literacy (statistical skills and knowledge) scattered throughout the school. In the past it was the role of senior leaders to source and supply all NCEA assessment information to departments. While this system did maintain consistency, the school leaders found that in supplying the data, departments tended to take less ownership of it and interrogated it less. Therefore, the school leaders took the intentional action to not simply give the information to the department heads, but as MMA puts it:

we are trying to upskill our HODs to know where to get that data, how to get it, how to find it themselves because that is important, because other than just being given the information and filing it away or looking at it for a Board report, they are actually starting to work with it too. It is just something that I noticed over the years.

This step in the process appears to rely upon the assumption that the data are readily available in a format easily able to be converted to useful information by heads of department. Otherwise, the expectation is that information will be created at a department level by heads of department who are, by their own admission, not necessarily strong in assessment literacy. This seems to contradict the approach of relying on an external company for initial data analysis.

A level of reluctance to engage with the NCEA assessment information by some heads of department was described by SMA saying, “others do it (analyse their results) because it is a requirement of the Board Report”. This seems to suggest a conflict between the perceived reporting of accountability and the desire for the process to reflect upon professional development and growth.

To address this conflict the school leaders had introduced a further significant change at the school. This involved attempting to shift the cultural climate away from accountability by getting the staff to reflect upon the purpose of their efforts by introducing the statement, “What we’re doing is purposeful and fulfilling”. The principal further elaborated:

Everything we do must be purposeful. So, with our NCEA classes, it must be *purposeful*. Why are we doing it and it must be *fulfilling* both for the students and for the staff.

Once NCEA assessment information has been created it is possible to move to the next step in the process.

Sense making

This is where the time allocated to the position of academic dean comes to the fore. The academic dean meets with heads of department and assists them in interpreting the information that they have gleaned from their data. The knowledge gained from this process is then applied through individual conversations with teaching staff, reflecting upon what is going well and what, if anything, needs to change. The goal is to have what is described as a “productive conversation of where we are heading to” (SMA). The senior leader described some of these conversations as “difficult conversations”. While these conversation types were not defined further, it may suggest from knowledge of the context that a portion of the reflection was to direct the participant to take responsibility and ownership of the information being presented. The perspective taken across all three participants was not one of blame or accountability but was more of possible changes that could be made to further support the individual. The terms “change”, (referring to the modification of a programme), and

“support”, (referring to the help given to students), were common throughout all three participants’ dialogues. The importance of the senior leader to have high-level data literacy skills was expressed by MMA who warned against the dangers of “falling into a trap thinking this is a problem” when looking at things from “one point of view”. Having greater data literacy provides “different reasons why something looks that way” and hence minimises that possibility of misinterpretation.

The next step in data use in School Tahi is to have teachers reflect upon their own teaching practice, in light of the NCEA assessment information related to the classes they had taught in the previous year. This is another source of variation in data use throughout the school. An illustrative example being:

Sometimes how teachers reflect will come down to how their particular HOD encourages them to. It does tend to land on the HOD to decide what you do with that (MMA).

This statement highlights the demands and expectations placed upon heads of department with regards to leading the process of interpretation and reflection.

After the reflection by teaching staff, the flow of NCEA assessment information through the layers of the school then proceeds to the individual student, through the work of the Student-Centred Support Team. Early in the year the academic dean undertakes conference meetings with all the senior students in relation to their course selections, asking questions such as:

How were your results? What did you feel about it? Where you happy with them? What stopped you from getting this, or how come you did so well? (MMA).

MMA argued that this was very important saying:

That is good because that gives the students a bit of an ownership to talk about, to really express where they are at. Rather than just being a statistic, it is actually talking about the real world and how they coped with NCEA.

These conference meetings are done in conjunction with the Student-Centred Support Team, linking pastoral and career considerations alongside academic performance. No specific examples were given here as to what constituted a pastoral or career consideration, but again individualisation was emphasized by suggesting that as a result of the meeting the school may look to “cater for quite an independent programme” (MMA). The individualisation of data, the importance of which all three participants reported, was also deemed problematic in a school setting due to the time required to devote to each individual. Likewise, the principal

acknowledged the difficulties involved and explained why the school was able to achieve individualisation, at least to some degree, stating:

We are not a big school, so we have, like last year, for example, we had 50 students in Level 3. So, it is relatively easy. I do not think you would do that in a really big school unless you had more people involved. Our person would look at maybe 200 students in total and go through that.

The final stage of data use is the reporting and sharing of the interpretation and reflection of the information that the data has provided, with all areas of the school community. The deputy principal in the school, with the teaching and learning portfolio, has oversight for the NCEA assessment information review process. However, it is the academic dean who creates overall reports for staff, senior leaders, and the school board of trustees. The sharing of data with the general public is the role of the principal and deputy principal. Each of the reports were written with the respective stakeholder readers in mind. SMA elaborated further on this by expressing the pressure felt to use achievement data to “promote to your community”. This was due to the feelings of “competition that you have with schools in your area”. This, SMA felt was compounded by the fact “media produce what the government produces and more than likely you are going to have to front that or explain certain areas of it”. The result of which, according to SMA, created a conflict between the sharing of success of individuals in their chosen pathways and the reporting of aggregated data.

Having described how School Tahī makes use of the NCEA assessment information it is time now to present the challenges that School Tahī has encountered when attempting to make optimal use of their data.

5.2.2 Challenges

One aspect that created challenge in the use of NCEA assessment information at School Tahī, as conveyed by SMA, related to the lack of support and guidance given to schools to access the information they required. SMA described the challenge as being:

The availability of useable data. So, data is available, but it is usable data that is not readily available. That is mostly because every school has to do it themselves, which is a complete waste of time.

The sense of frustration portrayed by the participant at this point was clear from the tone of voice, through to gestures, demonstrating that this was something strongly felt. The term ‘useable data’ in this comment is interpreted to mean NCEA assessment information, implying the belief that much of the creation of assessment information is not unique to each

individual school. This suggests that some measure of analysis can take place independent of the school context. SMA then moved to articulate a possible solution, stating: “There needs to be some centralised system where the data is there, and a programme for what leaders and HODs require”. The responsibility for solving this challenge should lie with NZQA, according to SMA, as he argued: “We shouldn’t have to do that (perform aggregation and analysis). It should be done for us by NZQA definitely. So that’s probably the hair pulling frustration”. SMA further explained that the central issue was actually all about time, saying:

Somebody has got to have that time. There is a monetary cost to it. So, I think that is quite valuable if we can have that. The information is there, but to analyse that information is enormous and in reality, the time required to get that information is so restrictive that we just don’t do it. It is about providing some of the time. There is a lot more that can be done, but we are time poor. I think that is more important for our HODs that don’t have a great deal of time to do that and also for us as leaders, like I don’t have time to crunch data and therefore, in many ways, we’re limited in our future focus based on what analysis that we’re doing.

Throughout the conversations with all participants the issue of time was something considered outside a school leader’s ability to control, and hence, exasperated the level of frustration felt. It is not just time for analysis that staff at School Tahī struggled but also time for department heads and teachers to reflect more deeply and implement changes to practice which could impact upon learning and achievement.

The next greatest challenge to School Tahī making optimum use of NCEA assessment information was the individual data literacy of its staff. The lack of individual data literacy was not restricted to just the teaching staff alone in this school, the heads of department were also explicitly mentioned by SMA who said: “Very few HODs really know data and how to use it wisely because not everybody is numbers driven and knows how to use the numbers”.

At one level, the tone of this comment may be seen not as criticism, but more a recognition that different teachers have different skill sets. However, at another level it reflects the underlying assumption from policy makers that heads of department can and should engage with the data provided to them. This suggests that the challenge to the school to make effective use of data is far deeper than simply the data being available and having the time to reflect upon it. The process requires someone within the school with high level data literacy to help interpret and create meaning from the data presented. The heads of department have been given a task that the school leaders are aware is outside the technical expertise of many to achieve. As mentioned earlier, this was one of the reasons for the establishment of the

academic dean position within the school to assist heads of department in gaining insight into the information that the assessment data provided.

Another challenge that was mentioned, although not in response to the specific interview question, arose naturally through the explanation of the purpose and importance of assessment information use. MMA raised the concern here that the system of NCEA made it difficult at times to consider the overall learning of the students due to its “very, very restrictive” and “assessment driven structure”. This highlighted a perceived conflict between assessment pressures and the learning needs of the individual student.

I now turn to what deliberate leadership actions the leaders in School Tahī have made to overcome the challenges of assessment information use.

5.2.3 Leadership actions taken to overcome challenges

As mentioned in the previous section, the need to support individual data literacy capability of departmental heads was a matter raised by School Tahī’s leaders. SMA describes this as:

The biggest avenue from a leadership perspective is working with some of the HODs in how to use the data, what does it mean and our next steps ... So it is about working more closely with HODs, but also the HODs working with themselves.

This included guidance being given to department heads, especially less experienced ones, as to how they might lead discussions with their staff. The principal elaborated,

So, we have talked about not making it specific to a particular person, but actually to their department and go okay, what are the plans that we need to do from now, what are the things we’ve noticed, what can we make work better?

This positions the senior leaders as the data experts themselves, to lead head of departments’ development. In School Tahī, this responsibility lay with the academic dean. The assumption being that the person appointed to this role had sufficient data literacy to help guide others in interpretation and reflection.

The next, and most deliberate leadership action was the development of the leadership structure and allocation of resources to the use of NCEA assessment information. The principal realised that there needed to be more oversight around NCEA assessment information as the size of the task of making use of data had increased. This prompted further changes to the middle leadership structure by allocating more fixed term management positions in the following year. These positions would be targeted towards data use with specific responsibilities, but what exactly those responsibilities would be, and what “more

oversight” meant in terms of the roles, had yet to be clarified. The principal commented that this area was a priority, and the school was committed to developing and improving it further.

The overarching challenges of time, especially for reflection by staff, and data availability, were not addressed explicitly as possible leadership action responses but were alluded to several times with references to the monetary cost. Again, the impression taken from the responses was that this challenge was outside the scope of what the school leaders themselves could work to address.

I now turn to what insights into NCEA assessment information use in School have been gained.

5.2.4 Insights gained

All three participants from School Tahī were clear and consistent in their explanation of structure and process. There seemed to be a common understanding and shared vision towards how assessment data could be utilised for optimum effect. This, the leaders from School Tahī believed, was achieved through “productive conversations” held throughout all levels of the school down to the individual students. The deliberate actions taken, and challenges faced, in using assessment data, are summarised in the table below.

Table 11 *Actions and Challenges in School Tahī*

Actions	Challenges
Intentional Cultural Shift Creation	Data Access
Specific Dedicated Leadership Structure	Staff Data Literacy
High Assessment Literate Senior Leader	HOD workload
Professional Development of HODs	Time
Emphasis on the Individual	Assessment vs Learning

Seemingly, the key underlying driver to all the actions undertaken by the leaders in School Tahī was the leadership surrounding assessment information use, as portrayed by the principal. The dedication of time, resources, and the implementation of an intentional cultural shift, were all aspects that the principal had instigated since arriving at the school. These

aspects underline the importance of the principal leading assessment information use and ensuring the systems and leadership structures to enable the creation of meaningful NCEA assessment information.

A sense of being powerless was common to all participants. The solution, according to the participants, was increased assistance from the national educational organisation tasked with assessment in New Zealand, that being NZQA (New Zealand Qualifications Authority).

The entire process of NCEA assessment information use in School Tahī appeared to rely heavily on the roles and responsibilities of heads of department. This seemed to be problematic due not only to the inconsistent degree of willingness by HODs to engage, but also to their actual ability to undertake the task being asked of them. As described earlier this can be seen as a point of criticism of HODs or one of understanding that staff had differing levels of assessment literacy. If it is seen as a point of criticism, then this places the expectation that it is the responsibility of the HOD to upskill themselves. This assumes that the HOD has the capability to gain the necessary skills, which is in contradiction to the belief staff have different skill sets. This leads to the question, what are reasonable, versus unreasonable, expectations of individual data literacy for heads of department?

The principal recognised many of the challenges mentioned above and was attempting to put measures in place to mitigate these. However, none of the three participants was optimistic that these measures alone would enable them to fully utilise or even access the assessment information that was possible to extract, due to the overarching problem of time. This possibly goes part way towards explaining the self-reported grade of ‘low’ confidence in making optimum use of assessment information.

The second case study school is presented next following the same descriptive structure as used for School Tahī above.

5.3 Case Study B: School “Rua”

5.3.1 *Setting the scene*

The context which situates School Rua in this study is an urban school servicing a low socio-economic population. This school described their level of confidence of making optimum use of NCEA assessment results for improving learning and achievement as, ‘moderate’.

Importance and purpose

The principal at School Rua, provided contextual background before answering any of the interview questions. PB started off by mentioning that the NCEA results for the school were “variable”. PB did not define this term, but the feeling portrayed was that as a school they were not entirely satisfied with the achievement levels produced in the national assessments by their students. For this PB offered several explanatory factors including the comment “as a senior leadership team we probably took our eye of the ball”. There was a strong sense that PB believed that the school leaders bore direct responsibility for students’ performance. However, PB then moved seamlessly into casting doubts on the validity of the NCEA system itself suggesting there was a systematic problem beyond the control or responsibility of the school leaders themselves. When mentioning the national targets for NCEA Level 2 as set by the Ministry of Education, PB expressed concern that these targets were becoming self-fulfilling saying, “I’m not sure about the degree to which they (the increases in achievement seen across the country) were more apparent than real” (PB). PB intimated “there’s been an actual kind of a grade inflation that’s been occurring” and hence the achievement targets for NCEA have lost their meaning. The example given was the increasingly upward trajectory of the national figures and just how this was occurring. The entire initial discourse had a sense of justification, but it was unclear whether the principal was appropriating blame or apologising.

With this background of thought expressed PB then moved to emphasize the strongly held belief that outcomes from the senior students (Year 11, 12 and 13) were in reality just a reflection of the work done, and foundations built, in the junior years (Year 7, 8, 9, and 10). Therefore, that was “where the vast majority of attention and conversations lie” involving evidenced based measures of performance at the school (PB). With this background context clearly articulated, PB felt comfortable moving onto the interview questions.

Thoughts surrounding the main purpose of NCEA assessment information use in School Rua were not consistently held by the participants of the study. Therefore, each participant’s view on the matter will be described separately. For the principal, “any assessment information is systemic feedback on how well you are doing”, with NCEA assessment information being “good feedback” on the progress of priority learners such as Māori and Pasifika. At this stage of the interview there was no mention of how this judgement of effectiveness was being carried out. In fact, in the very next sentence PB gave the impression of a lack of control and being unable to influence the level of achievement, saying: “By the time we get to the NCEA

years, my opinion would be that you've almost run out of steam in terms of your ability to impact".

The senior leader of the school stated that the main purpose of NCEA assessment information use was "the ultimate indication of whether we're successful or not and with which groups we're successful". How and in what ways success was to be determined was not mentioned. Although, SMB did clarify that it was the teaching and learning programme being measured. Here, SMB emphasized his belief that NCEA assessment information was of limited importance to the school, stating - "schools deliver great outcomes to students beyond qualifications and beyond NCEA outcomes". These seemingly contradictory statements suggest a conflict between assessment itself and the opportunities for wider learning available at the school.

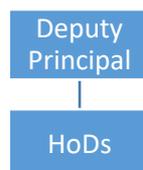
The final participant in School Rua was the middle leader who believed that the main purpose of NCEA assessment information was for reassurance saying, "finding out whether what we've done is right or not". The feelings of professional accountability and judgement are clear throughout this response. However, it does not appear to be restrictive as MMB did feel empowered to try "new things" and "test changes" as teaching is adjusted due to professional reflection. This comment is indicative of a mediating role, attempting a balance between accountability and professional development.

In the description of the purpose of NCEA assessment information use in School Rua very few specifics were given. The next section discusses the structure and processes used to gain knowledge from assessment information.

Structure and processes utilised

The overall structure of the levels of responsibility in relation to assessment information use in School Tahi is shown in the figure below.

Figure 17 *Leadership Structure in relation to assessment information use in School Rua*



The leadership structure in relation to assessment information in School Rua is very simple. The deputy principal of the school oversees the process, and it is the responsibility of the

heads of department to implement it. The school leader assigned the responsibility for overseeing the process of data use in School Rua is not chosen due to their particular skill set or experience in assessment literacy. One of the senior managers in the school inherits the portfolio as part of their job description. At the time of the study the senior manager with this responsibility was new to the position in this school and so was apologetic about articulating the processes involved. There appeared to be an assumption that persons appointed to a senior leader role, containing within their portfolio responsibilities including assessment information, will have already acquired the necessary technical and individual data literacy skills to lead in this area. As SMB put it, “I’ve just sort of intercepted and taken up the mantle of what my predecessor has been doing”.

The process of the using NCEA assessment information in School Rua will now be described under the same framework and headings as used previously for School Tahī. The content for this section was distilled from all three participants’ responses.

Creating information through analysis

The first set of NCEA assessment information used by School Rua is a report created by NZQA, entitled the “Principal’s Report” (Appendix A). This analysis gives an initial global overview for the principal on key indicators relevant to all schools. Next, the senior leader in the school does “a bit more of mash up on that data” (PB), around how particular subject areas have performed. Exactly what that entailed and how it was carried out was not elaborated upon. At the time of the interview, it was still early in the academic year and the new senior leader had not yet completed any reporting so was unclear as to the expectations, “I’m still getting my head around it” (SMB). SMB indicated the enormity of the task ahead saying, “seems pretty massive at the moment”. In order to cope with the situation, SMB simply trusted that the department heads have “done this all before” so need little, if any, guidance. However, in conversations with various department heads SMB has started to form some doubts evidenced as hearing “a few different stories and expectations”. Leading SMB to speculate: “I’m just a little bit sceptical as to whether there’s any consistency there of what we’re actually getting them to look for”.

This comment further reinforces the lack of a clearly defined framework of expectations related to the interpretation and reflection of assessment data. The responsibility for what processes were followed seemed to be on the department heads themselves, reinforced with SMB saying:

I had conversations with a few different Department Heads, and they all wanted different things from it and I'm still a little bit confused as to what the general staff want and what the appetite is around there for getting that information.

This suggests that there either is no direction given as to what data to use, how it is to be used, or framework of reporting structure expected, or simply that the new SMB had yet to discover it.

The department heads access to NCEA assessment information appears mostly to be through the school's SMS (Student Management System – in this case “Kamar”) (Appendix B). Although there was mention of some accessing data directly from the NZQA website, and still others that went to the senior leader directly to ask them to extract the data for them. The analysis and aggregation of the data in terms of ethnicity and gender and then performance as compared to the previous two year's data, was the responsibility of the relevant heads of department. This step in the process assumes the heads of department have sufficient individual data literacy to carry out this task. SMB mentioned here that there are HODs who challenge the process itself, asking questions such as “what is the point?” and “who reads this?”. Moreover, SMB intimated that these questions arise from overworked staff who “see the number crunching and the reflecting and the reporting as just an extra onerous task”. The responsibility for addressing these concerns SMB believes lies with them, saying “I think it is my job ... to make them see the relevance of the task”.

Once the data analysis has been completed, interpretation of the NCEA assessment information created needs to occur. The ways in which School Rua achieves this is described in the following section.

Sense making

The next step in the process of NCEA assessment information use is the interpretation that heads of department apply to the NCEA assessment information. There was no mention here of any explicit assistance being given to the heads of department to carry out this task or in fact exactly what this task involved. The focus on the interpretation appeared to be for report writing. In addition, nothing was said about individual teacher reflections or what guidance or responsibility that department heads had in that final process. Although SMB did describe some assistance they had given to leaders in a previous school, but this was more in terms of the extraction of data. The sharing of data throughout the wider school community was only mentioned here in terms of celebrating successes.

The sharing of NCEA assessment information with students was not mentioned as part of the process. SMB recalled a passing interaction with a student whose “eyes would glaze over” when referring to NCEA assessment information. This was why SMB had decided to “stop referring to the outcomes so much in my interactions with the kids”.

What was missing from all three participants’ responses was any form of description of professional conversations relating to the information arising from the NCEA assessment information, at any level of the school organisation. The professional development in School Rua, according to the principal, involved embedding inquiry and professional learning groups, “containing conversations around process”. Exactly what “conversations around process” entailed was not described, however, the principal did say it was “not about conversations around outcomes”. The type of evidence used to assess the inquiry undertaken by staff was not at any stage stipulated. This avoidance of conversations relating to NCEA assessment information, according to the principal was intentional stating: “I’m not convinced that having lots of conversations around the outcomes at the end are that useful”.

This can be interpreted as questioning the importance of the outcomes themselves or the importance that staff reflect upon them. Either interpretation implies the belief that using assessment results will not affect learning and achievement.

This sentiment is echoed by MMB saying:

I think that a big answer to our question (of improvement) is that the difference in cohorts over a couple of years have been quite huge, so it’s really hard over a couple of years for me to judge yet whether understanding and using NCEA assessment (information) have made a difference.

This comment suggests that MMB also was still yet to be convinced that making use of NCEA assessment information could in fact impact learning and achievement at all. The impression gained from all the interviewees was that in School Rua, the leaders did not believe that the use of NCEA assessment information was of high importance (or in some cases, even relevant) to improving learning and achievement. This is in contradiction to the self-reported high level of importance grade that the school placed upon the use of NCEA assessment information as recorded in the national survey.

The challenges that the participants of this study from School Rua encountered when attempting to make optimal use of their data are now discussed.

5.3.2 Challenges

Even though SMB described many department heads not having the technical literacy to access NCEA assessment information, this aspect was not mentioned by any of the participants as a specific challenge to be overcome. Only the principal expressed frustration over the lack of access to some information that NZQA holds. One particular example given was a breakdown by achievement level for individuals that was available to the students, but schools were unable to access due to NZQA citing privacy issues. This the principal felt, was absurd since all the relevant information was already available to schools, so it would just be a saving in analysis, “it annoyed the hell out of me” (PB). However, further into the interview the principal greatly softened his stance stating:

I would speak very highly of the way in which NZQA offers data for me and for the school. I sort of see what I want to see by and large and offhand I couldn't tell you of something other than that one example where there is data I would want to see and don't.

Like School Tahiti, the one aspect that all three participants agreed was a major obstacle to the optimal use of NCEA assessment information was, time. Time to analyse data, to evaluate it and reflect upon it. It was seen that time allocated to this process conflicted with all the myriad of other duties and expectations placed upon department heads and teachers. As SMB put it, “Time is a hard one to solve. Isn't it? Because there's so many important things happening in a school”. Here, the participants from School Rua did not equate the difficulty of time with the monetary cost but with competing priorities. This gave the overall impression that this challenge was not one they had the ability to solve.

SMB articulated another challenge as the sense of competition inherent between both departments and individual teachers. This was described as a “bit of one-upmanship”. SMB further elaborated saying:

Certainly not healthy to use it as a performance measure to judge how good, bad or otherwise a teacher is and by extension, I don't think it's great when you have teachers sort of, even if it's just in jest, nudging each other about NCEA results.

This comment highlights the difficulties encountered when the conversations arising from NCEA assessment information focus upon accountability rather than personal professional development. This is not the intention, as SMB laments “It's not an accountability measure for me. I would hope they see it as a chance to, like I say, improve, learn professionally, develop professionally”.

I now turn to what deliberate leadership actions the leaders in School Rua have made in an attempt to overcome the challenges of NCEA assessment information use.

5.3.3 Leadership actions taken to overcome challenges

Although organisational and individual data literacy were not explicitly mentioned as challenges, SMB suggested that assisting staff in this area was important to do. However, SMB then freely admitted that they are not able to do so themselves, elaborating:

this is certainly not something I'm proficient in at all, a bit of statistical novice in interpreting things and not misinterpreting things because you know, lies, lies, damn lies, or whatever it is.

This is an action that MMB also believes needs to occur. MMB further clarifies:

There isn't teaching around it (use of assessment information) particularly. I've found most of what I do by trial and error. I don't think there's anything particularly set up.

The tone of voice, inflection, and cadence seemed to convey a sense of stress and tension. This was interpreted to be due to the lack of clarity of the expectations involving NCEA assessment information use.

MMB voiced an additional action that they believed could be taken, that is, to be given sufficient time and resources to carry out the process of NCEA assessment information use. This MMB felt was not an action they could influence themselves or even one that could be accomplished, stating, "I don't see there is a particular strategy around (achieving) that". The emotion perceived here was one of despondency.

Next, the insights gained from School Rua's use of NCEA assessment information is presented.

5.3.4 Insights gained

The leaders from School Rua seemed to place the importance on NCEA assessment information use on accountability rather than professional development. Although throughout the interviews this was not consistently expressed, often leading to contradictory statements. The principal of the school placed far greater emphasis on assessment information that was not related to qualifications. That is to say, data was drawn from the junior levels, Years 7-10. This was outside the scope of this study but is important to reference here as it gives context through which to view the interview responses. There is extensive use of junior assessment data, and a great deal of analysis is carried out by an external company in relation to that data

at School Rua. The emphasis placed on the junior assessment data is in part, the principal explained, a result of the lower retention rates moving through to the senior levels in the school.

The beliefs and approaches towards assessment information of the principal, were reflected, to some degree, by the other two school leaders in School Rua. This reinforced the importance of principals in the process of NCEA assessment information use.

The actions needing to be taken, and challenges faced, in using NCEA assessment information, are now summarised in the table below.

Table 12 *Actions and Challenges in School Rua*

Actions	Challenges
Professional Development of HODs	Time
Allocation of time	Culture

It is important to note that the actions listed here are not ones that are currently being undertaken by the school leaders at School Rua. They are actions that the leaders suggested should be made but felt that they were unable to enact that change themselves. Not having a highly assessment literate school leader does appear to impact upon School Rua’s capacity to make optimum use of NCEA assessment information. However, of equal importance seems to be the culture and attitudes towards such use, as portrayed from the principal down through the leadership structure.

The third case study school is presented next following the same structure as the two above.

5.4 Case Study C: School “Toru”

5.4.1 Setting the scene

The context which situates School Toru in this study is an urban school servicing a high socio-economic population. This school described their level of confidence of making optimum use of assessment results for improving learning and achievement as, “high”.

Importance and purpose

The participants from School Toru claimed assessment formed an integral part of education and since they “are in the education business, assessing in some form is part of (their) job”

(SMC). To ensure that the school is meeting the needs of the pupils they rely on “hard data” to determine whether what they “are doing is working or not” (SMC). The use of the term “hard data” suggests a desire to embrace a form of evidence-based practice where the evidence relies on measures external to the school.

A sense of professional accountability is contained in MMC’s comment on the purpose of NCEA assessment information use being “a measure for how we are working over time and in a particular year”. This is indicative that they felt some degree of personal responsibility for assessment results.

The principal, in defining the purpose of NCEA assessment information, concluded:

Assessment information use is to inform the teacher of learning. It gives you an idea about what learning has occurred and how successfully it has happened.

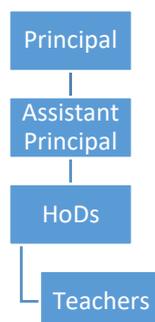
Analysis of the responses from all three participants suggests that all three hold the consistent view that the value of NCEA assessment information lies in the reflections that teachers can make on the practice to impact the learning of their students. This reflective practice expectation was illustrated with comments such as MMC saying, “to see the changes I’m making today, are they taking effect, are they not?”.

The structure and processes, as they pertain to the use of NCEA assessment data in School Toru, is now described.

Structure and processes utilised

The overall structure of the levels of responsibility in relation to NCEA assessment information use in School Toru is shown in the figure below.

Figure 18 *Leadership Structure in relation to assessment information use in School Toru*



It is noted that the principal is included in this diagram (where it was absent in the previously discussed case study schools). At School Toru, a key point of difference is the commitment

and active engagement of a collective, rather than named individuals, regarding the leadership of the NCEA assessment information process. This commitment was apparent through the analysis of all interview responses, which alluded to collaboration, and a shared sense of responsibility between the principal and the other school leaders interviewed. An example illustrating shared commitment is how SMC described the start of the NCEA assessment information creation by saying, “So middle of January, I start panicking, No, the principal and I start panicking”. Moreover, the principal stated, in several places throughout the interview, how interactions also occurred with the assistant principal regarding the NCEA assessment information process. The strength of this shared responsibility that the principal felt for NCEA assessment information can be illustrated by the comment:

From a principal’s point of view, I often have a sense that I don’t have as thorough an understanding of how things have gone for students at a particular faculty. I don’t have such a sense of how the faculty is performing ... (I) have a sense of not having my finger on the pulse to the same extent as what I would like.

The assistant principal (who has the responsibility for overseeing the NCEA assessment information process in School Toru) had a high level of individual data literacy. This is not always the case in schools as the principal pointed out:

the ability to do statistical analysis, that’s a real skill and not everybody who heads into leadership necessarily has that. So that is an area that can be difficult for schools.

It is noted here that the assistant principal’s role includes some measure of analysis for the heads of department and the heads are supported in work to interpret the NCEA assessment information. A further layer in the leadership structure is the role the heads of department have to play in the use of NCEA assessment information. As with the other two case schools this is a significant responsibility. The HoDs report to the principal and the school board on assessment matters and assist teachers to interpret their individual data.

Teachers are included in this leadership structure too as the reflections that they undertake underpin the entire NCEA assessment information process at School Toru. So much so that the reports back to the principal and board contain these reflections highlighting the importance placed upon them.

Now that the leadership structure has been outlined, the processes School Toru uses for NCEA assessment information will be described.

Creating information through analysis

The initial assessment information used in School Toru is the Principal's Report as generated by NZQA (Appendix A). This is sent to the board along with early analysis with aggregation of criteria such as Māori, Pasifika, University Entrance, and endorsements. Analysis and interpretation are carried out by the principal and assistant principal in collaboration with each other. Once this has been completed the assistant principal then interrogates the data looking at the individual students who did not achieve the expected level of qualification. These students are contacted, and a discussion is had with each one. This is, as SMC puts it, "to see where they're at and if there is anything that we can do to help them".

The next step in the process is for heads of department to access the NCEA assessment information. The expectation is for all heads to access this themselves from the School's SMS, (Student Management System – in this case "Kamar") (Appendix B). The assumption is that they know what to look for and how to interpret it. Although the assistant principal does supply guidance there is a measure of autonomy in what the heads of department report. It was noted this does lead to a sense of frustration, with MMC saying:

Each department head is expected to look at results for their subject area. I do not know if I should say this, but I will. To be honest it is a little bit all over the place. I do not think there is one consistent approach.

There is obvious hesitancy here in highlighting any area that may allude to needing improvement. MMC however goes further stating: "A lot of it is just people helping each other. There is not a big system in place there. That is how bad it is. It is realistic".

Finally, an innovation that School Toru is looking to implement is the use of an external provider to supply additional analysis for them. SMC is keen to explore how such additional data can be utilised, but at the same time appeared daunted by the prospect saying:

Gosh, that is an enormous amount of information. I think that is a great example of how you could have too much data almost, I think.

This can be problematic especially for heads of department as SMC explains:

My HoDs are wary of it, which I understand. I think that is often the thing with data. There is so much, and it is saying this is the pertinent stuff because there is a tendency for people's eyeballs to glaze over it and go back in their head. There is also a tendency for it to be something that the HoDs feel they are responsible for and to say help I'm stretched for time, which I completely understand. But then the responsibility shifts to me.

There appeared to be a sense of a continual drive to make use of all possible assessment information available. However, with the limited time available there was the impression that this was becoming a source of anxiety and stress.

Once NCEA assessment information has been created the next step in the process is to make use of it. The way in which School Toru does this is presented next.

Sense making

The making meaning from the NCEA assessment information in School Toru, was described by the school leaders as by heads of department with their respective staff. This took the form of professional conversations of heads of department with their staff. This was firstly modelled by the assistant principal who had similar forms of conversations with the heads of department. Noting that this is extremely time consuming, SMC stated:

I meet with my HOFs every fortnight. That's nine hours of two weeks gone. You can imagine how busy that is. I guess I like to think that I'm role modelling to them that they're doing the same.

However, there is no system in place to ensure that this process is being followed, as SMC further clarified "Do I have a measure to check that? No. I know they are doing it because they will".

Some of these conversations were described as "pretty gritty conversations" (SMC) or "robust conversations" (PC), suggesting that addressing personal accountability may cause tensions to arise between the participants of the conversation. That such conversations and reflections form part of the documented appraisal cycle at School Toru, further blurs the lines between professional development and accountability.

The challenges that School Toru school leaders described when attempting to make optimal use of their NCEA assessment information are now discussed.

5.4.2 Challenges

One of the big challenges faced by the school leaders at School Toru was the conflict between professional learning and accountability. The principal explained:

Most of our staff are (people pleasers). They don't like to think that they are, and I have tried help this by saying this should be a learning environment. But definitely (accountability) yeah terrible trouble ... So our staff are quite risk averse ... I think that accountability is (the problem) because they get so anxious about that and they just see it as much more than it is ... being their own worst critic.

The principal seems to imply that it is the staff who have the wrong impression on what the assessment process is trying to accomplish. MMC provided a contrasting view stating:

I know that teachers do feel that the results reflect on them and that they have to justify. We have a system where if a student doesn't achieve, we have to justify why, and teachers take that as a criticism. It should be used for a professional development. It should be used as a learning opportunity for us as staff. But a lot of staff see it as a punitive measure, if that makes sense.

Both MMC and the principal agreed that the main purpose for assessment information use should be for professional development. However, they differed in their opinion about the level of importance accountability plays in the process. MMC elaborates:

This is a big issue and again I do not think that is being addressed, I think that our senior leadership needs to address that and say what we are using the data for and why we are using it. Teachers make their own assumptions if they are not given clear information.

The next challenge mentioned by all three participants was the issue of time. There was more that all wished they could achieve with relation to assessment information but felt constrained due to time. Comments such as "That is the time-consuming stuff" (SMC), "It is a heavy workload for staff and takes time" (PC), and finally "we're supposed to have time to do that, but you know what it's like. I don't think that has necessarily been addressed" (MMC).

The last commonly shared challenge that was raised by all participants related to the difficulties associated with a lack of individual data literacy of staff. This was not only staff's absence of knowledge or ability to perform the tasks, but sometimes, as SMC explained:

I think also staff do not necessarily, and this is a horrid thing to say, I don't know that all of them actually are as adept with data as possibly they think they are.

I now turn to what deliberate leadership actions the leaders in School Toru have made to overcome the challenges described.

5.4.3 Leadership actions taken to overcome challenges

To address the issue of accountability the principal stressed the need to work on the culture of the school. The principal articulated this by saying:

What we keep trying to I think is model that we are trying things, and we are not sure whether this is right or not and gosh, no that did not work as well, no that was not a good outcome, we could try this now. Try to model that we are a learning community. That all of us are learning and we can be beaten up over that. But we will try something, but it is all learning, and we should not be afraid to get something wrong. We do not have to be perfect. We are just on a journey of learning.

Actions relating to the issues surrounding the lack of time were not mentioned by any of the three participants. Again, as in the previous two case schools, this could mean the School Toru participants also felt time was a matter they could not influence.

The final deliberate action taken was the intentional access to professional development involving the technical needs of staff. This had led to mixed results as it was done on a voluntary basis as SMC explained, “It is problematic with some of the staff who do not have those skills, are very reluctant to engage in that”.

The absence of individual data literacy was something that SMC did not have any idea of how to address, and why she looked to me as the researcher and asked, “How do I improve data literacy?”

I now turn to the insights gleaned about processes for using NCEA assessment information by School Toru.

5.4.4 Insights gained

In summary all the interviewees from School Toru were consistent in their explanation of structure and process for data use and its analysis. There was a common idea articulated about how NCEA assessment information was to be used throughout the school. This, the leaders from School Toru believed, was achieved through reflections undertaken by teachers to make actionable change to their practice based upon the evidence presented by the NCEA assessment information. The deliberate actions taken, and challenges faced, in using NCEA assessment information, are summarised in the table below.

Table 13 *Actions and Challenges in School Toru*

Actions	Challenges
Attempted Cultural Shift	Accountability vs Professional Development
Professional Development of HODs	Staff Data Literacy
High Assessment Literate Senior Leader	Time

There was a lack of a school wide culture of learning, stemming from trust that all parties involved being driven by the same motivation. The school leaders also lamented the absence of time built into the system of NCEA assessment information use to give the opportunity for the depth of reflection necessary to truly achieve actionable change to learning and achievement.

The summary of all three case schools is included next.

5.5 Summary of the chapter

For all three of the schools chosen as cases, data use was self-reported to be a high priority. Although for all three schools, the purpose varied as interpreted from their participants responses to the interview questions. The table below shows an overall summary of purpose and structure for each of the three case schools.

Table 14 *Summary of the three case schools*

School	Main Purpose	Structure
Tahi	Individualisation and professional development	Specific role created for assessment literate senior leader, and designated group of leaders
Rua	Accountability	Role of a senior leader's portfolio without regard to individual data literacy ability
Toru	Accountability and professional development	Role of both Principal and Assistant both of whom are seen to be assessment literate

In School Tahi the importance of considering the individual student was emphasized in the use of assessment information and so the school structure reflected that. Professional development, based upon evidence gained through assessment information, occurred through dialogue between leaders and staff. This process was led by assessment literate school leaders. For School Rua, NCEA assessment information was seen by the school leaders as a

way of measuring the performance of teaching and learning. Although the school leaders cast doubts around the effectiveness of measuring performance in this way. With their structure, School Rua did not make an explicit attempt to give oversight to someone with high individual data literacy skills. Thus, dialogue involving NCEA assessment information was seen to be of little use. Finally, for School Toru the impression taken from the participants' responses was that both accountability and professional development featured prominently in NCEA assessment information use. The oversight structure appeared to be a shared responsibility between the principal and a senior leader, both of whom gave the impression of high assessment literacy.

The self-reported differing levels of confidence in the use of data in the three schools, ranging from '*high*' to '*moderate*' to '*low*' confidence seemed to be independent of the systems and processes in place. School Tahī had more specific resourcing and structure applied yet had the lowest level of confidence. This seems to suggest that the level of confidence reported in the survey related not only to how results were being used throughout a school, but also to the potential that assessment result use had to influence overall school improvement. School Tahī school leaders wanted to achieve more with NCEA assessment information but felt constrained to do so. This is a possible explanation for their reported low confidence level. The self-reported grade of '*moderate*' confidence in making optimum use of NCEA assessment information by School Rua seems to be reflective of their attitude towards the process. The amount of NCEA assessment information created in School Toru was significantly greater than the other two case schools included in this study. This may explain the self-reported grade of '*high*' confidence in making optimum use of NCEA assessment information. However, as the participants' responses portrayed, simply having a large amount of information available is not sufficient in and of itself to make optimum use for improving learning and achievement.

Chapter 6: Discussion and Conclusion

6.1 Chapter Overview

The aim of my study has been to examine the use of data by school leaders to improve learning and achievement of students. Data use relates to student performance data (results), which have been collected at a national level. For New Zealand secondary students such data are from the National Certificate of Achievement (NCEA). The findings of my study are grounded in these data, however, some of the broader themes resonate with findings from literature about data use irrespective of a particular country's assessment qualification system.

I have explored how school leaders have made use of national assessments by surveying, interviewing and interpreting school leaders' thoughts about, and descriptions of their NCEA assessment information use in their school. Many factors can affect a school leader's ability to engage with NCEA assessment data and these differ for each school setting. In my study the participants' descriptions suggested that their capacity to use NCEA data was limited yet enabled by systems and analysis tools (referring to the procedures that schools employ surrounding data use and the technology used to enable interpretation). Pressure of internal and external accountability added a further factor to be explored as did the understandings and beliefs regarding NCEA assessment information present within a school.

I begin this chapter by first addressing the research questions and then discussing key themes that have emerged from my study. Bryman (2006) argues that this placing of emphasis upon the research questions is a "chief manifestation of the pragmatic approach to the matter of mixing quantitative and qualitative research" (p 118). I draw insights from both the national survey and the case study interviews methods that underpin my study inquiry, while linking with existing literature. Undertaking this process of integrating or mixing of methods and methodologies, is an important aspect of the mixed methods research design which forms the framework for this thesis (Fetters & Molina-Azorin, 2017b). The value of applying a mixed methods approach, along with possible further research avenues are presented next.

Leading on from this, I suggest possible recommendations for more effective use of NCEA assessment information in New Zealand schools and offer my own framework as a contribution to assist secondary schools in New Zealand increase their capacity to use NCEA assessment information. The application of this framework towards the critical incident

described in chapter 1 is then considered. A summary of the key findings finishes the chapter, before offering a final word.

I will first recap the research questions which are:

Main research question. To what extent and in what ways do secondary schools use NCEA assessment information to improve learning and achievement?

Sub question 1: What are the challenges that school leaders encounter in gaining insight into NCEA assessment information?

Sub question 2: What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

Before undertaking my study, it was my belief, due in part to my mathematics background, that the answer to these research questions would uncover clear methods and processes to follow for effectively utilising NCEA assessment information to improve learning and achievement in schools. While I expected some differences between schools, my intention was to illuminate processes which would contribute to more effective use of NCEA assessment information. This was for not only my own work, but also for other school leaders across New Zealand to be able to follow. I was surprised to discover that I had greatly underestimated the complexity of the topic being studied. The sheer amount and interconnected nature of the factors involved, coupled with the reliance upon complex human interactions, all contributed to the puzzle of trying to make sense of how to make effective use of NCEA assessment information. It was indeed a far more perplexing problem than anticipated.

6.2 Main Research Question. To what extent and in what ways do secondary schools use NCEA assessment information to improve learning and achievement?

The school leaders who participated in my study responded to questions regarding NCEA assessment information use in a wide variety of ways. The range and type of response elicited revealed that the nature of this question contained surprising subtlety. Where similarity of response was expected, the reality was something quite different. I had thought that the inclusion at the end of the question of, "to improve learning and achievement", would focus the responses on teachers' and middle leaders' actions. In doing so, I was showing my own personal bias, neglecting to consider the multiple roles that NCEA assessment information use has in a school.

The way school leaders in my study described their ideas was dependent on the thoughts they held about the roles and responsibilities associated with NCEA assessment use. Considering NCEA assessment use by separating out the roles and responsibilities reflects what Day (2011) refers to as a “layered approach” to leadership. This he has described as “a complex process but more likely to lead to greater improvements” (p. 15). The layered approach refers to the consideration and separation of the levels of impact of leadership upon the institutional processes, (the level referring to the area of the school being considered). My findings indicate that school leaders recognise the importance of work being undertaken on four different roles (layers) to ensure the effective use of NCEA data. These layers represent leadership actions as interpreted through the experiences of the participants, namely principals, senior leaders, middle leaders, and teachers.

Firstly, school leaders viewed the principal’s role in using NCEA assessment information to be about setting school wide goals and measuring expectations. This process of review was founded upon the information contained within the principal’s report (Appendix A), that is released by the New Zealand Qualifications Authority (NZQA). This principal’s report gives an indication of overall school performance, concentrating on achievement levels for NCEA Levels 1, 2, 3 and University Entrance (UE). It contains a comparison of the school’s last five years of student achievement, with all schools within the same decile band, and the national figures. The reports are broken down by year level, gender, and ethnicity. The data are displayed as numbers, percentages, and graphs.

The tone of the responses concentrating upon principals’ actions suggests a broad approach towards NCEA assessment information use, namely a sense of answering to different authorities and stakeholders, in other words being compliant and accountable. This aligns with what Robinson et al. (2009) identify in their best evidence synthesis as their first important leadership dimension, establishing goals and expectations and connecting work to a clear purpose. Nevertheless, the details of how these goals were determined, including how much of a role political and community expectations played, were not elaborated upon in either my study or within Robinson et al.’s synthesis.

Secondly, NCEA assessment information use was deemed as a necessary focus for senior leaders. In New Zealand senior school leaders are described as associate principals, deputy principals, assistant principals and heads of school. It was this group who were described as having oversight of the use of NCEA data within the school. These senior leaders collated

NCEA assessment information from across the school departments and helped the principal prepare the community reports. To achieve this, they relied upon reports provided by the individual departments. The precise makeup and nature of these reports depended upon the guidance given to the middle leaders by the senior leaders. This level of guidance was described by some participants as being unclear one of whom explained:

To be honest it is a little bit all over the place. I don't think there is one consistent [method]. Like, if I want information, I quite often have to go to a number of different people to get the whole picture. Everyone is always looking for what they want, if that makes sense, rather than just a general overview (MMB).

The level of frustration, at the perceived lack of a consistent procedure, was evident in both the tone and body language at that point of the interview. This suggests that having a clearly articulated procedure to follow for report writing was seen to be an important step in the process of NCEA assessment information use.

In addition to report writing the senior leaders were tasked with assisting middle leaders with responding to the knowledge gained from the departmental reports. This included discussions about possible actions to take because of areas of performance not meeting expectation. The nature of these discussions was at times couched in terms of accountability and at others in terms of professional development. This highlights the duality of the purpose of NCEA assessment information use, as seen by the participants.

The tensions felt from outside influences, including the Ministry of Education and the wider community, were present throughout the participants' responses. Some participants commented how the level of external reporting appeared to overshadow NCEA assessment information use, thus impeding their ability to take a more formative, reflective approach to directly impact learning and achievement. It appears that some participants felt disempowered because expectations seemed to be externally set at the expense of recognising and working with the realities of their schools' unique contexts.

Thirdly, the role that school leaders viewed as important in relation to NCEA assessment information use is from *middle leaders*. In New Zealand middle leaders are described as Heads of Faculty (HoF), Heads of Department (HoD), and Teachers in Charge of a curriculum area (TIC). Middle leaders were described as accessing the NCEA data for their individual department through their local student management system. An example of the type of information available through one of the common New Zealand student management systems (Kamar), is given in Appendix B.

Responses indicated that it was middle leaders who shouldered a large amount of the responsibility for making use of NCEA data at the local level of the school. This was clearly reinforced through understandings gained from the case study schools. The importance of middle leaders is echoed by authors such as Grootenboer et al. (2015), who argue that middle leaders play a vital role in “driving and securing sustainable change” (p. 523). Throughout my interviews, an emphasis on the implementation and management of the process for NCEA assessment information use was acknowledged by school leaders, as residing with middle leaders. Here, there was again, a sense of a dual purpose, one being the collation and interpretation of information to support senior leaders in their role. The other purpose being, how to involve and support teachers to make sense of NCEA assessment information and use it to guide their next teaching steps. It was in the space between senior leaders and teachers that the middle leader assumed a mediating role. It is the middle leader role that Bassett (2016) claims requires essential training and support to navigate this mixture of responsibilities.

Like principals, middle leaders are also expected to set goals and expectations as a result of examining the NCEA assessment information available to them. Whilst overall expectations were set by senior leaders, middle leaders in my study seemed less clear about their responsibilities and felt unsupported. The writing of reports was described as a major component of the use of NCEA assessment information by this group. However, the reporting process in and of itself did not seem to be linked to any direct efforts to improve learning and achievement. This finding is consistent with Kerr et al’s. (2006) claim that emphasizing accountability in terms of things such as reporting systems does not help teacher reflection. Moreover, Kerr et al. (2006) argue that this aspect of the process often lacks relevancy to those engaged with it as the purpose of reflection is being overshadowed by the accountability aspect.

Within the responses describing the role of middle leaders, specific actions were suggested that could be taken where areas of poor performance of students had been identified. The participants described actions being taken by middle leaders such as changing the makeup and structure of courses. Another action middle leaders were described as taking, was adjusting the timing of assessments, both in duration of the teaching program devoted to it as well as the placement within the school calendar. Some participants felt that these steps were reactionary and did not look for the deeper meanings behind areas of poor performance. Participants described situations where this concentration on the program itself had led to

some departments dropping problematic standards rather than seeking efforts to improve the outcomes. Dyson (2021) argues that such a reaction towards assessment information use “may not lead to meaningful learning” (p. 131).

Fourthly, the final role that the senior leaders’ comments described is the *classroom teacher’s* role in using NCEA assessment information. The role being presented here is the interpretation and experiences of the participants of my study when thinking about what classroom teachers might do. Here school leaders seemed to base their comments relating to the classroom teacher’s use of NCEA assessment information as stemming from their own positions and impressions as both teachers and leaders in their respective schools. Participants explained that classroom teachers were expected to access their NCEA results through their local student management system. These results were described as being placed into the individual classroom teacher’s markbook, after being downloaded from the NZQA website.

Participants of my study responded that to improve learning and achievement, it is important for classroom teachers themselves to use NCEA assessment information by inquiring into their own teaching practice. This type of inquiry relates to classroom teachers being expected to analyse NCEA assessment information in terms of the performance of their students’ achievements. The term *teaching as inquiry*, a process promoted by the Ministry of Education and included in the New Zealand curriculum document (Ministry of Education, 2007), was mentioned by many participants. This process was described as a method to be employed by classroom teachers when approaching NCEA assessment information use. This highlights the expectation inherent in the education system, that teachers themselves have a responsibility to respond to the information gleaned from assessments. An assumption within policies and expectations for teachers to engage in ‘teaching as inquiry’ is that teachers have the capacity to use data to reflect. The findings from my study challenge this assumption as school leaders reported classroom teachers struggling with skills necessary to carry effective NCEA assessment information use. This potentially limits capacity for ‘teaching as inquiry’, where inquiry requires or is prompted by data use from NCEA assessment information.

Changes to teaching practices or changes to the resources utilised in the classroom were not explicitly mentioned by any school leader as a possible avenue for review by teachers. Neither were collegial professional conversations, exchanging ideas and strategies between teachers teaching similar courses mentioned. However, accountability conversations between staff of differing roles were included in their comments. I was not surprised that some level of

detail was absent in the surveys due to the time required to type descriptions, but I had expected it to be mentioned in the case studies. This omission is possibly because pedagogical changes and collegial conversations were assumed to take place independent of the process of NCEA assessment information analysis.

Throughout the responses there was frustration conveyed that influences beyond the classroom were affecting students' achievement levels. School leaders felt that teaching and the strategies employed, although important, were only one factor influencing achievement. The feelings expressed were that these factors beyond the classroom were not being recognised by those who held them responsible for the achievement of their students. This related to both internal and external pressures. The impression was one of accountability dominating the discourse surrounding NCEA data use.

In undertaking this study my intention was to separate the challenges involved with NCEA assessment information use from descriptions of processes. In responding participants did not always adhere to this distinction, at times they combined mention of the challenges faced as they described their processes. This suggests that these school leaders may see challenges and processes as inevitably linked, further highlighting the complex nature of NCEA assessment use.

I now turn to briefly summarise the responses to the sub questions of my study, beginning with the main challenges faced by schools in gaining insight into assessment information.

6.3 Research Sub Question One: What are the challenges that school leaders encounter in gaining insight into NCEA assessment information?

The responses received from both the survey and the case studies were collated and categorised into four broad challenges and compared with existing research and scholarly writing. These challenges school leaders recorded are placed in the order of frequency and are as follows: time, individual data literacy, accountability, and organisational data literacy. A brief description of each of these challenges is now presented.

I begin with *time*. This was the most frequently identified challenge, but one that the respondents described as being powerless to address. It was seen as an issue of resourcing, and school leaders felt that the responsibility for that lay external to the individual schools.

The next most frequently mentioned challenge involved gaps in *individual data literacy* skills. This relates to the statistical literacy in engaging with NCEA assessment data and the ability to understand and manipulate this data for improving learning and achievement. School leaders reported that these gaps existed across all four roles described in the previous section. This resonates with researchers Mason (2002) and Supovitz and Klein (2003), who found that teachers lacked the skills necessary to utilise assessment information effectively. Sebestyén (2021) is another researcher who agrees that individual data literacy is one of the greatest challenges facing schools in the pursuit of using assessment information to improve learning and achievement. In my study the school leaders described how having NCEA data available did not necessarily mean that the data could be used to improve learning and achievement. They attributed a lack of staff skills and knowledge to correctly interpret NCEA assessment information in a productive manner. Likewise, authors such as Herman and Gribbons (2001), Wayman (2005) and Datnow and Kennedy-Lewis (2012) have described similar situations where data by itself were insufficient to achieve improved student outcomes. This need for more than data emphasizes the importance of sense making in the process of NCEA data use.

Next, the challenge of *accountability* produced strong emotional responses from the participants. The concept of accountability as a barrier to using NCEA assessment information was described by many participants with negative connotations. Where accountability dominated the narrative, distrust in the process of NCEA assessment information use was expressed. This finding endorses those of authors such as Linn (2000) and Mandinach and Schildkamp (2021) who recorded accountability as being a challenge to the effective use of assessment information throughout their writings about data use. My study found that these accountability pressures, both external and internal, hampered the ability of a school to use NCEA assessment information in a truly reflective process. Indeed, this echoes what Kerr et al. (2006) claimed as possible negative effects that accountability can have for schools wishing to use assessment information to improve student outcomes.

The remaining and most articulated challenge by school leaders relates to aspects of broader *organisational data literacy*. The concept of organisational data literacy relates to an organisation's capacity to utilise data (in this context data are the results collected nationally and available to schools). This is about structures and tools necessary to interpret data, as opposed to the statistical knowledge and ability to interpret data which makes up the definition of individual data literacy.

There are several different issues related to organisational data literacy that participants described as challenging. These comments related mostly to school leaders struggling with their ability to manage NCEA data. These challenges related to issues such as access to the relevant information, and the possession of the tools and technology necessary to interrogate it. Some school leaders presented these challenges as requiring attention but felt that this was not something that schools themselves should have to overcome. The reliance on technology for disaggregation and analysis of NCEA data was explained, and frustration due to the lack of access was clearly expressed. The lack of resourcing in this area meant that school leaders felt hampered in their ability to effectively use NCEA assessment information to improve learning and achievement. The necessity to consider the technology in the context of data use echoes authors such as Wayman et al. (2004) and Lachat and Smith (2005) have been calling for, namely more advanced technology to be used in the educational sphere. However, to date in New Zealand, the issue of access to appropriate technology has remained (Dyson, 2021).

The actions taken by schools in response to the challenges faced in making effective use of assessment information are now presented.

6.4 Research Sub Question Two: What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

As with the challenges faced, the responses for this section were collated and categorised into four broad actions. These are placed in the order of the frequency of the response, and are as follows:

- (1) Development of a school culture surrounding data use – to counter the accountability narrative.
- (2) Supplying data aggregation and analysis support – to improve organisational data literacy.
- (3) Providing professional development opportunity – to improve individual data literacy.
- (4) The provision of time.

Each of these actions, taken directly, relates to the four main challenges. This implies that school leaders are aware of these challenges and are demonstrating attempts to address them.

The first broad action recorded by school leaders as needing to be undertaken to help create the conditions needed for effective NCEA assessment information use was the development of a *learning culture*. Henderson and Corry (2020) agree with the need for this action, stating

“school leaders have an important role to play in setting a school's culture around data use” (p. 239). This development was described by school leaders as more than clarifying the purposes of assessment, but also for creating principles or values (e.g. trust and honesty), through which NCEA assessment information use can be approached. This was explained as developing an atmosphere of trust and honesty in an attempt to mitigate the challenges associated with accountability. Timperley (2004) argues this is one of the most important actions that leaders can take to create an atmosphere conducive to the use of assessment information to improve learning and achievement. Although described as an action to undertake, detailed descriptions of how this creation of a learning culture was being enacted in schools was not recorded by the participants, nor was the degree of success that such actions have been achieving in their respective schools. Participants’ responses only highlighted the broad importance of a learning culture in a school to support effective (non-threatening) NCEA assessment information use and not the detail of how that translated to practice. The next three actions described by participants are more deliberate, intentional acts of assistance given to staff to help with NCEA assessment information interpretation and use.

The second most frequently described action was for senior leaders to assist with NCEA data aggregation and analysis to attempt to address the organisational data literacy challenge. This action related to support being given to staff to assist them with NCEA assessment information use, including technical analytical assistance. A deliberate dedication of resourcing to the process of NCEA assessment information use was mentioned in the responses. Several school leaders stated that their schools employed outside contractors to overcome the technological insufficiencies being experienced. They explained how this had helped in the time consuming and more complex aspects of assessment analysis.

The third action, in terms of frequency of response, was the provision of professional development for staff. This typically took two forms, one to address gaps in individual data literacy knowledge, and the second to provide skills to conduct productive ‘open to learning’ conversations. The need to provide these levels of support within schools is highlighted throughout the literature surrounding data use (Earl & Katz, 2006; Robinson et al., 2002), with scholars such as Dyson (2021) calling for greater support in this area in New Zealand.

The last and most frequently mentioned action was supplying sufficient time for the process of NCEA assessment information use to be undertaken. Perceived lack of time was a challenge, but the counter to this was that the resourcing of time was perceived positively as

conducive to effective NCEA data use. It is important to note that these descriptions related to an action that school leaders felt was important to take, not detailing an action that they themselves had undertaken.

On the surface it appears school leaders are aware of the challenges involved with effective NCEA assessment information use and are trying to take steps to address them. Nevertheless, a deeper examination of the challenges experienced by school leaders is warranted in order to try and understand why schools seem to be struggling with effective NCEA assessment use. I do this in the form of a discussion, examining key themes that emerged from my research with justification as to why they warrant further consideration. These themes are the:

- (1) Challenge of time.
- (2) Centrality of data literacy.
- (3) Vexed problem of accountability.

I begin my discussion by revisiting the challenge of time.

6.5 The challenge of time

Time has already been mentioned as both a challenge and an enabler for NCEA assessment information use. I now move to delve under the surface of this oft mentioned challenge. The issue of time in schools is a real problem that has been highlighted by scholars. For example, Wylie et al. (2013) claimed that the demands on school leaders have been increasing with many feeling that the workload is becoming unmanageable. Bassett (2016) explains that this has resulted in work that typically resides with senior leaders finding its way down to middle leaders, thus meaning that all levels of school leader are being challenged with increased demands upon their time. However, while ‘time’ may be cast by some as primarily an issue of workload, my research findings suggest it is more than this. The issue relates more to professional expectations that are placed on school leaders and classroom teachers, and those which they place upon themselves, to do a good job in the interest of their learners.

The manner and degree to which NCEA assessment information use can positively affect learning and achievement, needs promotion throughout the education sectors to increase its priority and the necessity to devote time to it. This echoes Absolum et al.’s (2009) call for a sharing of practice and experiences of data use in schools from across the sector. If educators clearly understood the impact NCEA assessment use could have, then the moral purpose of improving learning and achievement would dictate that this would be an imperative and not

simply thought of as just another administrative task to be completed. Thus, increasing the level of priority and urgency associated with NCEA assessment information use may encourage schools to intentionally set aside more time to carry out the process.

If this challenge of time is to be overcome, then the matter of whose responsibility it is to address becomes urgent. While schools in New Zealand do have quite a lot of autonomy when it comes to allocating resources, those resources are finite.

The broad implication here is that strategies are required to create time to engage with NCEA assessment data. Earl and Katz (2002) in their description of a school data literate leader, highlighted the importance of creating time for the interpretation of data. Timperley et al. (2007) argued that time was important for promoting professional learning opportunities that impacted upon student outcomes. For Timperley et al. (2007) this was how the time was used. The findings from my study support the need to shift the perspective from time as a 'problem', to time as an enabler, to gain and communicate insight into NCEA assessment information with the purpose of improving the learning and achievement of students.

The participants did not present particular ideas about how to best make this time available. In the New Zealand schooling system, there are a range of opportunities available to enact this provision of time. While the investigation of such opportunities has not been the focus of my study, the key point is that the data from my study suggest the need for senior leaders to look more closely into how they might provide time allowances for school leaders to work with the NCEA assessment information.

While time to effectively use NCEA assessment information is a practical necessity, focusing on the lack of time can mask other issues. For example, staff in schools that are struggling with data literacy could spend an inordinate amount of time trying to grasp concepts and gain knowledge from information that they do not really understand. This may present as an issue of time, but it could be a symptom of other concerns. This leads to the next key discussion point, the centrality of data literacy.

6.6 The centrality of data literacy

Central to the phenomenon of NCEA assessment information use is the concept of data literacy. This is present at two levels, individual data literacy (relating to an individual's statistical skills, knowledge, and capability to interpret and use data by teachers and leaders) and organisational data literacy (relating to the school's broader systems capacity of

procedures and technical analytical ability). As Mandinach and Schikldkamp (2021) argue, becoming a truly data literate organisation is a complex undertaking, ensuring that both these forms of literacy are well established.

The responses from both the survey and the case study schools confirm the complexity of the situation related to data literacy. School leaders reported struggling to embed sound data literacy processes for analysing, interpreting, and gaining insight into NCEA assessment information. This was claimed to be the case for both organisational and individual data literacy needs throughout the school, resulting in frustration being expressed by school leaders. They shared that the demands being placed upon them from external sources such as the wider community and the Ministry of Education, were at times exceeding their capacity to achieve due to the presence of data literacy inadequacies.

One of the actions described to overcome organisational data literacy challenges was to engage with external organisations for technical support. The cost associated with using external organisations was described by the leaders from the case study schools utilising this method as significant. Participants from my study who applied additional resourcing in this area tended to be those from higher socioeconomic status and private schools. This is not to infer a causal link between economic status and access to appropriate data, such a broad generalisation is not possible given the scale of my study. However, it does raise questions that warrant further consideration, such that greater insight into this area is needed. With the autonomy available to schools in New Zealand, the distribution of resourcing such as this may be aligned more closely with the priority that school leaders believe is appropriate.

My study has shown that in some schools there are school leaders who report being confident with their individual data literacy (skills and ability to interpret data). However, there is further evidence that suggests this situation is not widespread. School leaders report that they and their staff are struggling with both the statistical nature of the information associated with NCEA assessment, and with the knowledge to be able to correctly interpret what it is showing. Additionally, school leaders reported that at times middle leaders demonstrated difficulty leading and managing this area of NCEA assessment information use.

The centrality of individual data literacy for the successful use of assessment information has been well established in the literature as a possible barrier to impacting learning and achievement. Earl and Katz (2006) stated that data literacy is one of the biggest challenges that schools face in terms of effectively utilising assessment information. Edwards et al.

(2022) stated that “teacher assessment literacy, data-based/data-informed decision making, and data literacy have emerged as focuses for policy and professional development” (p. 2). In their review of data literacy and leadership literature, Henderson and Corry (2020) stated that scholars described school leaders as having the responsibility of increasing the data literacy levels of teachers. However, in my study the school leaders themselves felt that they were ill prepared in this area, with respondents to the survey querying where they could access assistance with data literacy.

Data literacy has been shown to be a problem and my study confirms that for my participants the problem persists. Repeated calls for greater data literacy by teachers and school leaders remain unanswered. From the school leaders’ perspective help is needed. Where does the responsibility lie for addressing the skill and knowledge gap of educators? My findings suggest the present impasse is because school leaders do not have the confidence that they are able or have the knowledge, to successfully address this issue.

The school leaders in my study realised their need for further knowledge and supports but not where to acquire it. This call for support resonates with Dyson (2021), who suggested that government agencies in New Zealand need to take a greater role in this area, stating:

Not every school in the country can do this. Government agencies have perhaps been too ‘loose’ and not offered sufficient support for evaluation capacity building in schools (p. 142).

The findings from my study suggest that there needs to be a multilayered approach to address professional development needs in terms of data literacy, as the skills and knowledge needed vary depending on the way in which NCEA assessment information is being used. This need for variation in approach was shown in my findings where school leaders described the different layers of responsibility and work required to make use of NCEA assessment information.

The importance of the different responsibility layers means that although there may be some common data literacy needs, school leaders also require professional development targeted to specific responsibilities related to the use of NCEA assessment information. Professional development needs to be a multifaceted approach with targeted development aimed at each layer.

Although data literacy is central to NCEA assessment information use, the findings from my study point to challenges beyond these essential skills. The purpose for which these skills are

directed needs to be considered. Therefore, I now move to discuss the challenge of accountability.

6.7 The vexed problem of accountability

Many school leaders articulated concerns over the issue they saw with accountability affecting assessment information use amongst their staff. This resonated with the findings of Mandinach and Schildkamp (2021) who also found that student learning and achievement tended to be used as measures of success and sources of evidence towards accountability. There is a tension between assessment information use for professional development, and assessment information use for accountability. The findings of my study clearly demonstrated that this tension exists in schools whose leaders participated in my research. Given the common concern with accountability pressures voiced by the participants, it is possible that this issue persists in schools beyond my study's boundaries.

These competing agendas are an issue. Hargraves et al. (2013) suggest such issues are present throughout the international literature. This tension between accountability and professional development can disrupt the effectiveness of data use for improving student outcomes. Great care is needed to navigate this tension as Kerr et al. (2006) argued, as there is the potential for accountability to distract from honest teacher reflection. Addressing this problem of accountability is vexing due to the complexity of accountability systems, and reliance upon the multifaceted interactions between educators with different roles and responsibilities.

Throughout my study, school leaders described efforts to improve the balance between learning and accountability by changing their prevailing cultures of accountability to ones of honest self-reflection in safe environments. While the participants referred to this in the context of NCEA assessment information use, there is some resonance with what researchers have said more broadly about data use. Authors, such as Moore (2014), feel it is necessary to counter the issue of accountability dominating the discourse surrounding assessment information. Earlier Firestone et al. (1998) mentioned how issues of accountability negatively affect the use of data to improve school outcomes. However, despite their concerns, the problem of accountability associated with data use in the wider context has remained.

The Ministry of Education (2011) also acknowledges that effective use of assessment information requires schools to create an atmosphere of high trust and collegiality. The comments from the participants' experiences shows that the issue of accountability clearly

dominates in the New Zealand schools participating in my study. There also appears to be no easy solution to eliminate this tension.

My study shows that school leaders are very aware of this tension and are trying to take actionable steps to address accountability. However, they also state that they are having limited success, making the issue of accountability a continually vexing problem. Urgent work is needed to resolve this due to the findings reflecting that the issue of accountability appears to be the source of many of the challenges that the school leaders in my study are encountering.

The responsibility for instilling a school wide culture lies with the principal (Robinson et al., 2009; Henderson and Corry, 2020). If an emphasis on the collective, rather than individual work, to build capacity necessary for effective use of data is to be taken seriously in a school, then the principal must lead this since they are responsible for the school culture (Alton-Lee, 2011). However, the implementation of this should not rest solely with the principal.

Leadership in the area of assessment information, needs to permeate right throughout the school. This is where the work of authors such as Hallinger (2011) come into prominence when explaining that the concept of leadership is not simply the actions of a leader alone. Instead, it means that when leadership is accepted as a collective activity, all members of an organisation can display leadership actions whether or not they hold a leadership title or not. It is about garnering expertise from within schools. This needs to be the case for NCEA assessment information to impact student outcomes. Therefore, to effectively develop a critical mass who have developed the knowledge and skills to work with data for school improvement and student learning, and so navigate the difficulties presented by accountability, a commitment from all members of the school is required.

Shifting the focus, I now consider how the research methodology helped to deepen the understanding of the phenomenon of NCEA assessment information use in New Zealand schools.

6.8 Value of mixed methods and further research opportunities

In the process of undertaking my study I realised the value of mixed methods research. Two different data collection methods were employed in my study, firstly a national online survey collecting both quantitative and qualitative data, and semi-structured interviews conducted across three different schools and involving three participants in each school. Having these different sources aided in the triangulation of the data and the confirmation of the ideas.

The moving between quantitative and qualitative realms resonates with my topic of NCEA assessment information use. School leaders are wrestling with gaining actionable knowledge from quantitative data sets which descend on schools. This requires school leaders to go beyond the quantitative into the qualitative elements. My study has found that this is a problematic area of transfer to practice for school leaders. This reinforces the value of using a mixed methods approach to investigate this topic.

The addition of the qualitative based interviews was particularly important for my study, as it enabled participants to give a more detailed explanation of the systems and processes enacted. An example of this was the ability to probe the sequence of NCEA assessment information use, from the initial analysis of the principal and senior leaders with the principal's report, through to reflection of classroom teachers of their individual classes results residing in the school's student management system. This level of detail was not possible to achieve simply through a survey with largely rated responses. It required the time and prompting that is able to be achieved through an interview method.

Another area for consideration is that the main research question has an underlying assumption, that the use of NCEA assessment information can positively impact learning and achievement. This assumption can be supported because it has a foundation grounded in research literature. Several authors, including for example, Alton-Lee (2011) and Kerr et al. (2006), lay claim that data use can lead to improved outcomes for schools. This underlying assumption was challenged in my study, admittedly by a minority of participants, but they did represent a voice that was yet to be fully convinced that the use of NCEA assessment information has the potential to improve learning and achievement. These participants expressed the belief that student performance was predetermined by the foundations built during the junior years of education. Therefore, it was felt by these participants that there was little benefit in engaging with NCEA assessment information other than superficially. This could be seen as a strength of my study, that this assumption was brought into question and so enabling this assumption to be surfaced and challenged.

There are limitations to this research being that it is a small-scale project. The main purpose of my research questions was to look from a school leader's perspective at what conditions need to be created, and challenges to be overcome, to optimise the effective use of NCEA assessment information. The level and degree to which improvements were actually achieved, did not constitute the focus of the project. Nevertheless, there does need to be a greater

understanding in how such use of NCEA assessment information translates into improved outcomes. This gives scope for further research to undertake an exploratory mixed methods approach to measure the effect of an NCEA assessment information intervention on learning and achievement. Another opportunity is to consider NCEA assessment information use from additional perspectives by seeking the voices such as those of classroom teachers, thereby, capturing the detailed process that teachers undertake when making sense of NCEA assessment information.

The DIKW hierarchy (data to information to knowledge to wisdom), which has helped frame the discussion of assessment information use, has also shown to be helpful with the approach taken towards my study. Taking the data I received from my participants, collating it to form information, analysing it to gain knowledge, then synthesizing it to derive actionable recommendations, mirrors the flow of the DIKW Hierarchy.

I now turn to the knowledge gained from my study by presenting a final summary of the key findings.

6.9 Summary of key findings

This study examined leaders' ideas about NCEA assessment information use in schools for improving learning and achievement. A mixed method approach was used to investigate NCEA assessment information use in New Zealand schools. The major findings from the survey of 56 schools and three explanatory case studies are now briefly summarized below and linked to the research questions framing my study.

How do secondary schools use NCEA assessment information to improve learning and achievement?

- (1) The process of using NCEA assessment information is involved and complex. It relies on a range of factors relating to being a data literate school needing to be in place before NCEA assessment information use can effectively impact student outcomes.
- (2) School leaders in different roles give focus and emphasis to different priorities and elements of NCEA assessment information use.
- (3) Several school leaders in my study were frustrated that they were unable to maximise their use of NCEA assessment information.

What are the challenges that schools encounter in gaining insight into NCEA assessment information?

- (1) Time is named as the greatest challenge, but this may be masking other issues.
- (2) The lack of individual data literacy skills and statistical knowledge amongst all levels of educators throughout the participating schools is hampering their efforts to engage with NCEA assessment information.
- (3) Participating schools are experiencing tension between the use of NCEA assessment information for accountability purposes, as opposed to being used for professional reflection to improve student learning and achievement.
- (4) The ability to perform the level of analysis desired to interrogate NCEA assessment information is lacking in some of the participating schools. This is due to the lack of available analysis tools.

What school leaders' actions help create the conditions for learning needed for effective use of NCEA assessment information?

- (1) Creating an atmosphere and culture of trust and honesty regarding the use of NCEA assessment information.
- (2) Resourcing the use of NCEA assessment information by providing access to external analysis tools.
- (3) Providing targeted professional development and training to staff to overcome data literacy issues.

Given the knowledge acquired from the analysis of my data, combined with a review of the literature, I turn to actionable wisdom gained, by considering possible recommendations to progress NCEA assessment information use in New Zealand schools.

6.10 Recommendations

In order for the use of summative assessment information to become *more than just results*, change needs to occur across the education sector as a whole as well as at the individual school level. Five recommendations have emerged from my study.

These recommendations represent possible courses of action to break the existing impasse. The proposed actions are located within the education sector, including the Ministry of Education, and the actions of school leaders. These recommendations are derived from the voices of the school leaders in my study who identified some actions for addressing the transfer of national results to ongoing teaching practices.

Two types of recommendations are presented. The first relate to *centralised recommendations*, focussing on actions that can be taken at a Ministry of Education level to help support schools in their use of assessment information. The second set are *decentralised recommendations*. They specify leadership actions directly related to the title of this thesis, “Leadership actions for effective use of assessment information” indicating that schools themselves have a responsibility to work with the results from national assessments.

I begin with the centralised recommendations.

6.10.1 Two centralised recommendations for the Ministry of Education

My study has been bounded by the data gathered from participating school leaders about systems related to NCEA assessment information use existing within their particular schools. However, the examination of the data gathered also showed that the participants had suggestions for actions deemed necessary at the system level and applicable beyond their immediate school contexts. These recommendations are for the Ministry of Education to:

- (1) give urgency into the implementation of centralised NCEA data analysis tools and address the existing inequity of access.
- (2) oversee the collation of exemplars of good practice regarding the processes and use of assessment information and share these with schools.

I now turn to explore each of the centralised recommendations in more detail.

Ministry of Education Recommendation 1: Provide improved data access and analysis tools

One way of alleviating the challenges faced when using NCEA assessment information for student learning is through the provision of improved student data access (the collation of all student data currently held by schools, for example: attendance, longitudinal assessment results, not just that resulting from national qualification assessments, everything that gives context and helps with sense making) and analysis tools throughout New Zealand schools. This was suggested by the school leaders in my study as urgent work.

NCEA assessment results and associated information are held centrally by the New Zealand Qualifications Authority. Some of this information can be downloaded into schools’ student management systems. However, according to the school leaders in my study, the functionality of student management systems available in New Zealand schools is limited in its ability to interrogate this data and combine it with the existing student data held by schools. This has meant school leaders are often struggling to situate their school’s results in

terms of their unique contextual constraints and opportunities. At present only schools able to utilise and pay for external providers can interrogate combined data in a more sophisticated manner. This creates *inequities* because not all schools can afford this type of support.

A possible strategy would be to combine and centralise all student data that schools currently hold. This could add meaning and help schools in their interpretation of NCEA assessment information. The advantage of storing all this centrally enables NCEA assessment information to be combined with other relevant data, so that it may be further interrogated, and deeper meanings gained. This interrogation is only able to be achieved, if in addition to the collation of data, access to analysis tools is provided to schools.

Having access to analysis technology for all schools could alleviate most of the organisational data literacy challenges that are being faced. The ability to drill down into the data would mean that schools could investigate the information that has the most relevance to them, thus removing the constraint of static reports. Furthermore, this centralisation of analysis tools would mean that new innovations in technology, for example more powerful artificial intelligence and deeper machine learning procedures, could be readily adopted.

This is why I call for the Ministry to give greater urgency to get these analysis tools, developed, tested, and refined and into the hands of school leaders tasked with making sense of national assessment data. The voices of frustration from school leaders are clear, as demonstrated by a senior leader from one of the case study schools who lamented:

Every school does the same thing. Every school has the same data, particularly at Year 11, 12 and 13 and therefore there are huge numbers of hours that schools put in to analysing the data [that is relevant for them] whereas it could be far more efficient and less time if it was done centrally. That would be the key element for me (SMA).

I am not advocating for the centralisation of the interpretation of NCEA assessment information. I believe that this form of centralisation would be counterproductive to effective NCEA assessment information use and has the potential for compliance to dominate the process. Rather, my plea is to provide access to combined data and analysis tools for all schools. This would result in improving equity in terms of the ability of all schools to interpret NCEA assessment information in context.

The next recommendation comes from the finding that school leaders are unsure of where to find resources to help understand the process of assessment information use.

Ministry of Education Recommendation 2: Collate exemplars of good practice

Recognition is needed from policy makers through to school leaders that statistical and knowledge use skills cannot be assumed on appointment to a position of organisational or managerial responsibility in schools. School leaders managing the process and systems related to NCEA data need guidance to undertake these responsibilities. The evidence from my study, from senior leaders new to their positions, confirms their struggle to grasp the nature and depth of what is required to work with assessment data to enhance student learning processes. School leaders reported not knowing where or how to access support in addressing assessment information needs. Therefore, greater promotion of, and access to, resources is essential if schools are to meet the requirement of effectively utilising NCEA assessment information.

This does not address the question of how this might be achieved. The professional learning and development field in New Zealand is complex with multiple providers and topics. The Ministry of Education, as the key contractor for professional learning and development, should prioritise support and guidance of teachers' individual data literacy so that NCEA assessment information can guide student learning and achievement.

Specific professional learning and development programmes were not the focus of this study but suffice to say there is a need for a change in approach in this area as the voices from the participants from my study illustrated. The expectations, and in some cases even the possible impact that assessment information can have for school improvement, are not well, and certainly not universally understood. The need is beyond simple data analysis skills, it is more an understanding of processes surrounding assessment information use that have been proven to add value.

My recommendation is for the Ministry of Education to collate examples of effective data use processes, including detailed descriptions of the data and context, along with the levels of questioning applied. The types of actionable wisdom acquired could be documented along with the outcomes achieved. These could be supplied to schools as exemplar modules, provided centrally, but sourced from real world practice. There are many existing organisations from universities through to organisations such as the New Zealand Assessment Institute (NZAI) (as introduced in Chapter 2, p. 41), that would be capable of producing such a resource. This is why I call for resources to be created and shared that show what can be achieved in a school.

The decentralised recommendations are presented next. These relate to school leaders' actions and responsibilities.

6.10.2 Three decentralised recommendations for school leaders

In a New Zealand secondary school setting, schools have a great deal of autonomy and choice in relation to their procedures and processes. In this decentralised space, school leaders have the power to respond within their unique contexts. The literature and the findings from my study point to recommendations for school leaders to help facilitate effective assessment information use by:

- (1) Requiring reports on NCEA assessment information to emphasize reflection.
- (2) Scheduling dedicated time for reflection enabling a school-wide approach to NCEA assessment information use.
- (3) Adopting school-wide data conversation prompts to guide reflection.

I now turn to explore each of the decentralised recommendations in more detail.

School leader recommendation 1: Require reports that emphasize reflection

The reporting of knowledge gained from NCEA assessment information use is an important part of the data use process. My study has shown that there is incredible frustration experienced in schools, particularly by middle managers who report being unsure of what is required of them when it comes to report writing. It is here that school leaders need to take responsibility and clarify expectations regarding what to consider when writing and structuring a report based on NCEA assessment information.

To be clear, I am not arguing for a one reporting style across all schools, as each school has its own unique setting, and the reporting measures need to be a reflection of that. Each school needs to establish what is important for the community it serves. The dimensions and measures of performance that help focus reflection need to be clarified for each school by the school leaders.

I argue that school leaders have a responsibility to give greater direction to report writers, to look beyond the numerical data and consider the underlying situational context. It is by developing this process that possible actions to guide overall school improvement can be established understanding what is possible in any given context. Leaving assessment information use in the realms of reporting leads to compliance and a culture of accountability.

To move the narrative back towards professional development, the purpose of the reporting must be seen not only as a sharing process, but also as a documentation of reflection. The underlying accountability aspect of reporting needs to be centred more upon the depth of reflection, knowledge gained and resulting actions, and less on the justification of performances.

In order for assessment information reports to include a greater description of reflection and resulting actions, time needs to be given for the reflection to take place. This leads into my second recommendation to school leaders.

School leader recommendation 2: Schedule dedicated time for reflection

My study has demonstrated that improvements can be made to effectively use assessment information but only if schools recognise that this requires a structured process of reflection. To be effective, I argue that this process of reflection cannot be left solely to report writers, that is individuals or small groups of individuals. The effective use of assessment information is a school wide issue that necessitates the whole school working together, engaging in reflection and professional open to learning dialogue.

The processes of people working together to make sense of the information and the wisdom that can be gleaned from the assessment information is the learning space that needs to be created. School leaders need to shift the culture from simply reporting results, to a shared reflection of what knowledge can be gleaned from them. To do this, teachers must have the time to reflect, and the opportunity to engage in conversation with others about NCEA assessment information. I encourage school leaders to emphasize the importance of NCEA assessment information use by deliberately scheduling time within their programs for professional reflection and conversations to take place.

Time is a complex issue and creating time is inherently difficult in a school system full of competing priorities. I suggest that school leaders consider combining the obligations of teachers' professional growth requirements to reflect upon their own teaching practice, with time to reflect on knowledge gained through NCEA assessment information.

It is crucial that the nature of the reflection and conversations involving NCEA assessment information remain in the realm of professional learning. A clear delineation here between competency and professional growth must be established so a culture of openness can be created. Where this distinction is not made, teachers often default to a defensive posture,

hampering efforts to achieve change. It is the school leader's responsibility to supply structures and guidance to ensure that this is the case.

The final recommendation to school leaders that follows is a simple step that can help guide NCEA assessment information conversations towards reflection, that is the use of data conversation prompts.

School leader recommendation 3: Adopt school-wide data conversation prompts to guide reflection

The last action that school leaders can take is to establish a clear conversation protocol to assist everyone in a school, regardless of role, to concentrate their effort towards reflection of NCEA assessment information. Having prompts for data conversations enable the focus of conversations to not only maintain its purpose, but also to direct the processes away from accountability and more towards professional learning (Edwards et al., 2022). Providing such prompts gives all involved a structure to talk about data and help guide the conversations through from information to actionable wisdom.

I suggest that Dempster's (2012) *disciplined dialogue* has the potential to provide schools with a conversation prompt for making sense of NCEA assessment information. This approach supplies a platform for interrogating information derived from NCEA assessment information. It aligns well with the transformation data hierarchy by providing questions to be posed at each stage. These are "What are we seeing?", "Why are we seeing it?" and concluding with an action "What if anything should we do about it?". These simple questions encapsulate the process of interpreting NCEA assessment information and provide a possible source of guidance for those struggling with how to engage in effective reflection. I urge school leaders to review how they are supporting their staff to engage in open to learning conversations and to consider the use of data conversation prompts. Some professional learning and development in the use of the disciplined dialogue conversation prompts could also further this recommendation.

In summary, the issue of effective assessment use is a complex one, and there is still work to do on many fronts for this topic. When I started this research, I was naively searching for the 'magic bullet' to solve the problems associated with effective NCEA assessment information use. Once the true complexity of the situation revealed itself through both the literature and the findings, I realised that a simple solution might not exist. Rather than a single solution, a range of actions were required to create a shift in culture and allow sense making and

effective sharing of NCEA assessment information, with the purpose of improving learning and achievement. Thus, I decided to distil the information and knowledge gained from both the literature and the findings to create a tentative framework that would help me better understand and share the learnings taken from my study and apply it to my own situation. What follows is the framework I formulated to help describe NCEA assessment information use in schools, that builds upon this discussion of reflection, sense making, sharing, and guided by Dempster's (2012) data conversation prompts.

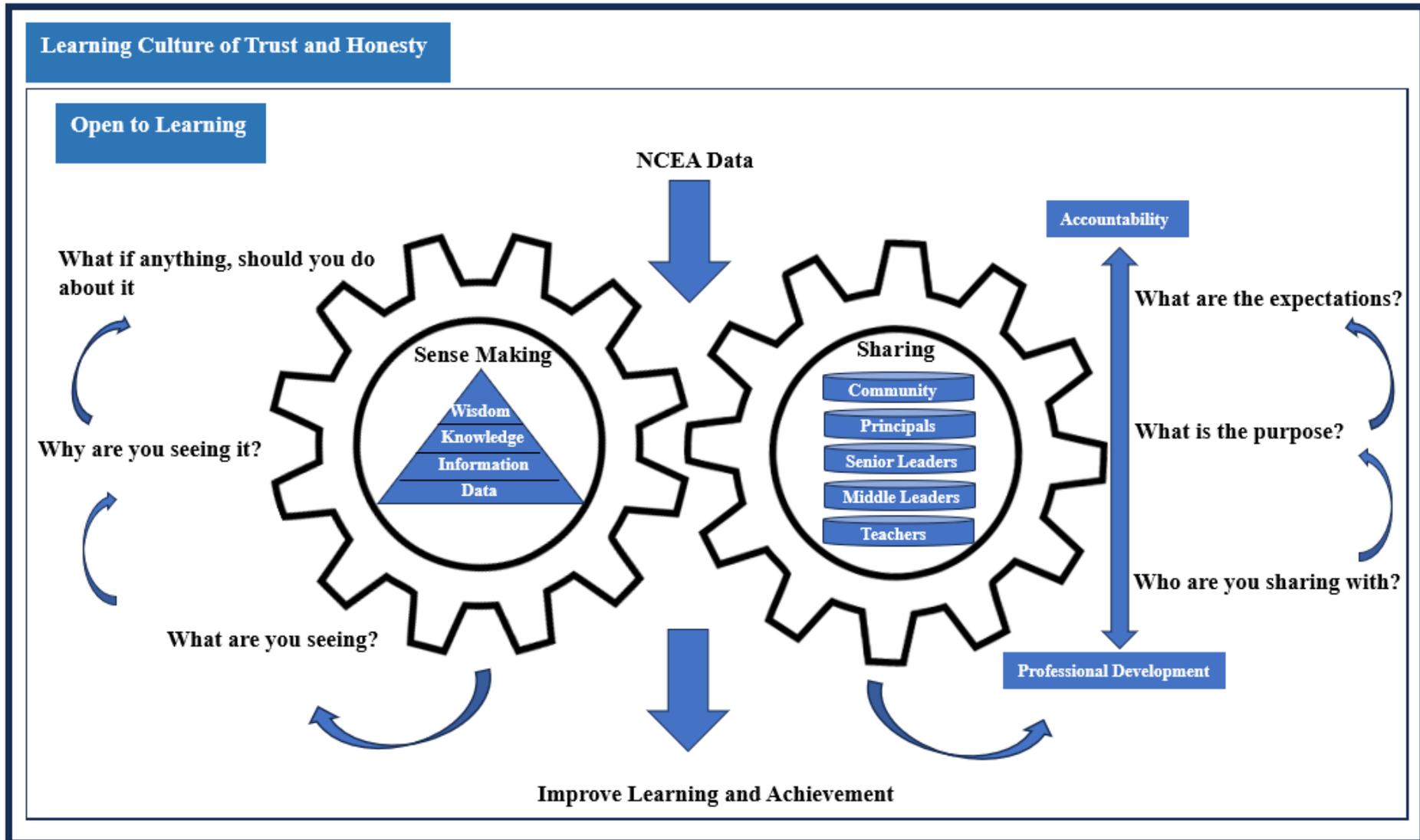
6.11 A possible new framework

Throughout my review of the literature, I came across many different frameworks that scholars had presented to show the process of data use. My concluding framework draws upon existing theory in the scholarly and research literatures as well as experiences of those participants of my study who were working directly with NCEA assessment information.

In the creation of this framework, I am attempting to exemplify the process of data to information to wisdom, that has been described throughout this thesis. This framework is an outworking of the recommendations to school leaders. It is envisioned that this framework might be used to assist school leaders to navigate the complex processes involved in making more effective use of NCEA assessment information. In other words, to apply the wisdom gained throughout this research and provide an actionable step to facilitate a way forward. The thesis itself has mirrored Dempster's disciplined dialogue, in terms of data use in New Zealand secondary schools. "What are we seeing?", "why are we seeing it" and with the framework and recommendations I have attempted to address "what should we do about it?" The emphasis here is not to supply "a magic bullet" but to emphasize a process, such as the kinds of questions to delve deeper to transform data into actionable wisdom. This framework attempts to visually represent the key actions that school leaders need to take for effective assessment information use in their schools.

The framework is shown in the diagram below.

Figure 19 *The cogs of NCEA assessment information use in New Zealand schools*



The key features of this framework are given below:

- (1) The bounding rectangle represents the need for an overarching culture of *trust and honesty* to be present within a school before any successful implementation of NCEA assessment use to improve learning and achievement is possible. The inner rectangle emphasizes that an important aspect of this culture is an *open to learning* mindset by all participants.
- (2) Sense making and sharing are key to the process of NCEA assessment information use and share equal prominence. They are depicted in the figure as cogs of an equal size. Cogs have been selected to represent the aspects of sense making and sharing in a desire to emphasize the reliance of each concept on the other. Effective NCEA assessment information use requires both sense making and sharing working in tandem to affect change.
- (3) NCEA data are at the top of the cogs and the arrows below give a sense that the cogs must both turn in order to produce improved learning and achievement. This represents a process requiring simultaneous movement, suggesting that the process requires effort that results in action being taken.
- (4) The effort is needed by all the those named in the dark blue area sharing their insights, so expertise is shared and developed by others. These are the roles associated with NCEA assessment information use are included in the sharing cog to focus the importance of the layers of leadership involved. This is to emphasize the importance of seeing NCEA assessment information use as a collective responsibility, even though the individual roles may differ. This is where the interconnected, interdependent relationship of those tasked with managing NCEA assessment information is highlighted. Another way of considering these different roles is as filters of the information, ones that work on NCEA assessment information as it flows throughout the school. These filters do not act purely as a syphoning mechanism, but more of a selective gatekeeping system with only the relevant information sampled at each level. This is needed due to the use, and at times purpose, differing depending on what level and role of the school the individual interpreting the NCEA assessment information holds. This distinction came out clearly in the findings such that its importance needs to be recognised.
- (5) The inclusion of the DIKW hierarchy inside the sense making cog is a representation of the stages of sense making required to gain actionable knowledge from NCEA data. I suggest that this hierarchy provides simple terminology to describe the transformations

required for raw data to lead to actionable outcomes, namely data to information to knowledge to wisdom. The underlying concepts of this hierarchy resonated strongly with how educators who displayed strong data literacy skills were describing their own experiences.

- (6) The tension between accountability and professional development is acknowledged and represented by the double headed arrow to the right of the sharing cog. Each layer of leadership needs to navigate this tension, and so its existence needs to be made explicit. Accountability is placed at the top of the cog deliberately, as the further up the layers of leadership, the more the accountability increases. The reverse is true for professional development, although both aspects of accountability and professional development are present at all layers of leadership, hence the continuous solid arrow.
- (7) Dempster's (2012) disciplined dialogue, on the left side of the sense making cog gives a series of question prompts to assist in the reflection process, always concluding with the consideration of possible action to be taken as a result of the wisdom gained. These questions are prompts to decide what actions are needed if actions are indeed required. The application of *disciplined dialogue* is extremely versatile. This technique can be applied at all levels of the school, from classroom teachers right through to school boards. *Disciplined dialogue* is a simple, yet powerful tool to support reflection which is the primary goal of NCEA assessment information use. The simplicity of the technique means that a school, especially one struggling with data literacy issues, may find that using this structured protocol assists staff with their data conversations. The purpose is to help all educators understand and articulate interpretations of NCEA assessment information regardless of their personal level of data literacy.
- (8) A second series of question prompts is placed on the right side of the sharing cog to help focus the report writing on the key aspects to share, giving greater clarity of the purpose for NCEA assessment information use at each subsequent layer of the school. This again emphasises the importance of considering the process through a layered leadership lens. My study showed that school leaders had a dual purpose for NCEA assessment information use. Not only were they expected to make use of NCEA assessment information in the context of their own role and responsibility, but there were also crucial elements in the overall flow throughout the school. This meant that individuals in each role were expected to not only provide help and guidance to those for whom they had responsibility, but also to assist with the interpretation of NCEA assessment information for those whom they were responsible to report. The first question "*Who are you sharing*

with?” encourages reflection on the focus of the sharing by considering who the intended audience will be. The next question “*What is the purpose?*” seeks to help focus the analysis of the NCEA assessment information by encouraging constant reflection on the purpose of that part of the procedure. The final question, “*What are the expectations?*” is where clarity of procedure is sought. This was indicated by several school leaders throughout my study as being important.

- (9) The final key feature of my framework is the suggestion of the circular motion of the cogs. This has been added to reflect the cyclical nature of the process, one that needs constant repetition and refinement at every stage.

The purpose of this framework is to be useful to those utilising NCEA assessment information in New Zealand schools. It is envisioned that the clarification of the underlying concepts of sense making and sharing, and the inclusion of the questioning prompts of my framework will help support all users of NCEA assessment information.

The context of my study was assessment information resulting from national qualifications assessments. However, this model can be applied over a wider range of contexts beyond this by simply changing the initial input to any data relating to student learning and achievement.

I now consider how the application of my framework might work to mitigate the critical incident described in Chapter 1.

6.11.1 Applying the framework

To help describe the application of my framework to NCEA assessment information use in schools, I return to the critical incident described in Chapter 1, involving the consequences of poor systems and a lack of statistical knowledge, impeding effective NCEA assessment information use. In order for this chapter to be self-contained the critical incident is now briefly repeated.

Critical incident

In New Zealand at the beginning of the year, department heads write a report to senior leaders describing a review of the previous year’s student achievement. The senior leader then collates all these reports and creates a summary which is then presented to the local school board.

The incident relates to information contained within a department report being misinterpreted by a senior leader because of limited statistical knowledge. The outcome is that the Board

requested an external review of the department. Here this example reveals a school where initial departmental reports are not discussed between the department head and the senior leader. This means there is no checking of the information before it goes to the Board and there is no learning loop to address any misinterpretations. Accountability is what matters.

I now move to consider how the application of my framework could have assisted in avoiding this critical incident.

Translation to practice

I will now apply relevant aspects of my framework to describe how they could possibly work to mitigate the situation outlined in the critical incident above. I begin with the aspect of sharing information and the questioning sequence on the right-hand sides of the sharing cog. I argue that the department head, in the above scenario, would have benefitted from such a questioning protocol when compiling the written report. Clearly understanding the expectations of the school with regards to student achievement would have forced explicit reflection on any area where this was not the case, regardless of the cause. By reflecting on who the information was being shared with means that others' levels of statistical literacy need consideration. Thus, assumptions of the ease of interpretation of the information must be challenged. Then, next by applying the sense making questioning prompts, "what are we seeing?" and "why are we seeing this?", would have encouraged the explanation and consideration of the causes behind all aspects of the NCEA assessment information. Following this protocol would have led to more detailed explanations, seeking to identify the underlying causes of the information being presented. This inclusion in the report of the reasons behind the information presented, would have given greater clarity and enabled a more informed interpretation by the senior leader.

Had the senior leader followed a similar process of following the sense making questioning prompts, "what are we seeing?" and "why are we seeing this?", would have led them to seek further information rather than jumping straight to an action. Both the senior leader and the department head had made assumptions in their process of sense making and sharing.

There was also an important aspect missing which was a major contributing factor in the cause of the critical incident. This aspect is a culture of trust and honesty in NCEA assessment use. Instead, an emphasis on accountability and a sense of clear division between roles existed. If NCEA assessment information use was seen as a collective responsibility, then open to learning conversations could have been prioritised and the entire

misunderstanding could have been averted. This critical incident demonstrates the potential of such a professional conversation protocol and how it can help to avoid misinterpretations and actions which would be damaging to a school's culture.

Following the principles of the data to information to knowledge to wisdom (DIKW) hierarchy it is not expected that school leaders will simply implement the information reported in my study to overcome any issues occurring in NCEA assessment use in schools. The data and information presented in my study needs to be seen through the lens of the individual schools and analysed through their own context. This crucial analysis needs to take place before knowledge can be gained that would lead to actionable wisdom.

6.12 The final word

Through my study I have found that there are challenges for operationalizing NCEA assessment information use in schools. While my study is grounded in a local context, the findings speak to broader issues around expectations on school leaders to engage with data, that is collected and available to them nationally, to support student learning and achievement. A framework is offered for senior leaders to support and guide them through thinking about how to engage in NCEA assessment information use. The contribution to the field relates to using evidence from local practices to speak to the local context. However, it moves beyond this to generating some recommendations and approaches for a process that will support leaders' engagements with the sense making and sharing challenge. These recommendations and the contributing model can be applied in the Aotearoa New Zealand situation, which is the context for the research, however, the broader principles are relevant beyond this context.

I hope that I have contributed to the wider conversation involving assessment information use. I believe that only with the pooling of skills and knowledge can the impasse existing in NCEA assessment information use be overcome.

I leave the final word to a principal from one of the participants from my case study schools.

Well, I guess my line is more about obviously you're doing this research and it would be wonderful if we had a bit more strategic collaboration across all high schools around what they're doing in terms of responsiveness to NCEA results and data and trends that may be trends that are not just contained to one school but may sit across a number of schools. We kind of live in a little wee sort of isolation I guess to a certain degree because we do what we think is best, but actually there may be better practice out there. We just don't necessarily talk about that sort of stuff. So, I guess the hope would be that there would be more of that sharing and

being able to work together and perhaps picking up on some ideas that some people are doing that are really making a difference and evidentially you can see the change in the achievement levels (PA).

Appendices

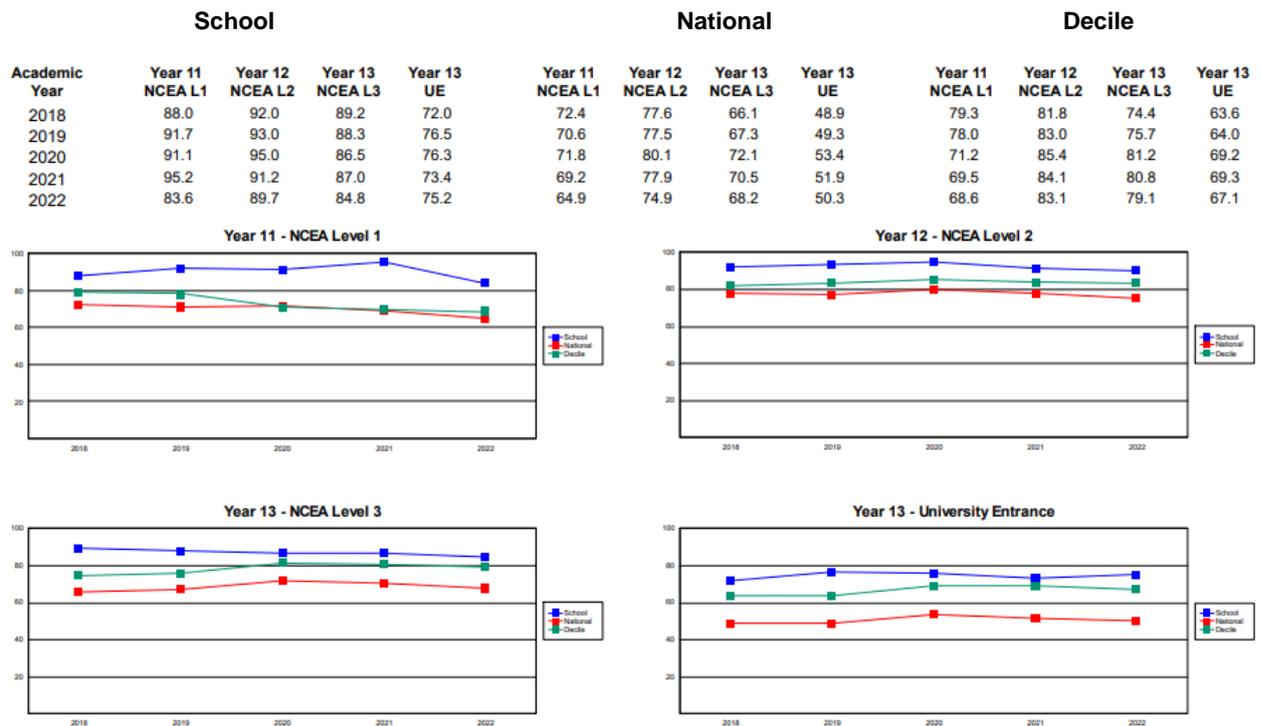
Appendix A Principal’s Report Example

The Principal’s Report gives a broad focus on comparative school wide overall achievement broken down by level, gender, and ethnicity. It is used to look for trends in performance when compared against national and decile benchmarks, as well as against longitudinal historical data. This report does not include any subject specific NCEA information.

Achievement in NCEA and UE: School

The first table gives a longitudinal breakdown of achievement of NCEA Level 1, 2, 3 and University Entrance. The numbers are given in percentage form and comparison with national and like decile schools is included. It is useful for tracking long term trends in overall achievement data.

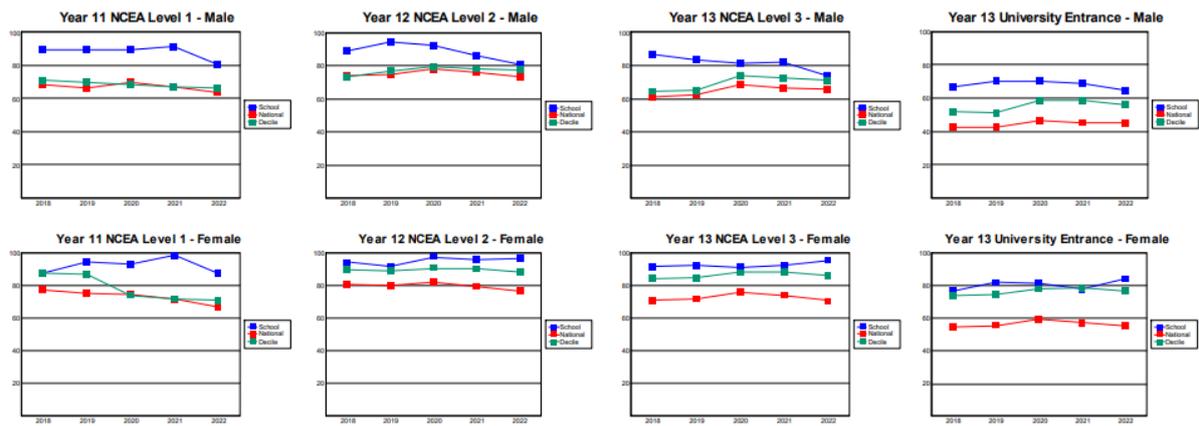
PR2 - Enrolment Based Cumulative Overall Results



The second table supplies the same information as above although this time disaggregated by gender. It is useful for identifying any discrepancies in gender achievement.

PR2 - Enrolment Based Cumulative Results by Gender

	School				National				Decile			
Academic Year	Year 11 NCEA L1	Year 12 NCEA L2	Year 13 NCEA L3	Year 13 UE	Year 11 NCEA L1	Year 12 NCEA L2	Year 13 NCEA L3	Year 13 UE	Year 11 NCEA L1	Year 12 NCEA L2	Year 13 NCEA L3	Year 13 UE
Male												
2018	89.2	89.0	86.7	66.7	68.2	74.2	61.0	42.4	71.2	73.2	64.1	51.8
2019	89.1	94.2	83.6	69.9	66.5	74.7	62.3	42.2	69.5	76.4	65.2	51.3
2020	89.5	92.5	81.4	70.0	69.6	77.8	68.5	46.8	68.3	79.7	73.7	58.8
2021	91.5	86.5	81.8	68.8	67.0	76.0	66.8	45.5	67.0	77.7	72.4	58.8
2022	80.7	81.0	73.8	65.0	63.4	73.3	65.6	44.9	66.3	77.5	71.3	56.1
Female												
2018	87.1	94.3	91.5	76.8	76.8	81.0	70.7	54.8	87.2	89.8	83.8	74.1
2019	94.3	92.1	92.1	82.0	74.9	80.2	71.9	55.8	86.4	89.3	84.8	75.0
2020	92.8	97.7	90.7	81.4	74.1	82.4	75.5	59.6	73.9	90.8	87.8	78.5
2021	98.1	95.9	92.2	77.9	71.5	79.8	74.0	57.7	71.8	90.2	88.4	78.9
2022	87.2	96.9	95.3	84.7	66.5	76.6	70.5	55.3	70.8	88.4	86.1	76.9



The third and final table in the report supplies the same information as above again although this time disaggregated by ethnicity. It is useful for identifying any discrepancies in ethnicity achievement.

PR2 - Enrolment Based Cumulative Results by Ethnicity

Academic Year	School				National				Decile			
	Year 11 NCEA L1	Year 12 NCEA L2	Year 13 NCEA L3	Year 13 UE	Year 11 NCEA L1	Year 12 NCEA L2	Year 13 NCEA L3	Year 13 UE	Year 11 NCEA L1	Year 12 NCEA L2	Year 13 NCEA L3	Year 13 UE
Asian												
2018	90.9	95.2	95.0	80.0	76.9	77.3	70.5	60.1	68.1	68.6	65.8	59.9
2019	91.2	100.0	94.4	72.2	73.9	78.3	71.3	59.3	64.9	73.8	65.7	58.5
2020	89.2	94.6	90.9	81.8	73.1	80.0	76.5	64.1	57.0	74.2	75.3	69.0
2021	94.6	91.9	91.7	80.6	70.0	81.1	76.2	63.4	53.4	78.0	75.2	69.0
2022	89.7	88.9	86.1	80.6	65.9	76.0	73.6	61.3	54.0	76.0	74.5	67.9
European												
2018	89.1	90.5	87.0	71.5	78.0	81.5	69.9	55.0	84.1	85.9	78.0	66.3
2019	90.8	91.5	86.6	78.0	76.0	81.1	70.8	55.1	83.0	86.6	79.1	67.1
2020	89.8	93.3	83.5	74.8	75.8	83.2	74.6	59.0	76.4	89.2	84.3	71.4
2021	96.3	90.6	88.5	72.9	74.0	81.2	73.2	57.2	74.7	87.1	83.4	71.5
2022	84.8	91.3	87.4	76.6	69.7	79.4	71.6	56.0	74.3	86.3	82.1	69.4
Māori												
2018	80.0	88.9	91.7	75.0	58.4	68.6	52.9	29.3	73.4	79.3	70.0	53.2
2019	88.2	89.5	75.0	50.0	57.7	68.9	55.1	29.9	74.2	79.9	73.6	58.1
2020	100.0	88.9	80.0	73.3	60.8	71.9	60.7	34.1	68.1	85.4	77.1	58.8
2021	85.7	84.2	71.4	64.3	57.7	68.3	58.5	31.7	67.1	82.2	77.3	60.0
2022	72.2	50.0	73.3	60.0	53.9	64.1	55.7	30.9	63.4	79.9	77.3	56.8
Middle Eastern/Latin American/African												
2018	100.0	100.0	100.0	100.0	74.0	78.4	66.5	50.2	75.6	79.7	76.4	68.7
2019	85.7	100.0	84.6	76.9	67.5	75.5	68.3	52.0	70.1	80.0	75.0	61.6
2020	100.0	100.0	100.0	77.8	72.4	77.6	73.2	57.7	66.0	77.1	78.8	70.3
2021	100.0	92.3	71.4	57.1	68.4	78.0	70.3	56.0	63.5	80.5	79.2	72.1
2022	69.2	100.0	81.8	81.8	61.3	73.3	67.4	51.4	63.3	78.6	71.5	61.5
Other Ethnicity												
2018	100.0		100.0	100.0	72.9	75.9	63.6	50.8	76.7	80.0	76.2	76.2
2019	100.0	100.0			74.4	75.1	67.4	52.9	75.7	75.6	86.4	63.6
2020	100.0	100.0	100.0	50.0	74.6	81.0	74.3	56.9	69.2	83.9	75.0	55.6
2021	100.0	100.0	100.0	100.0	73.2	78.5	72.9	55.1	76.3	70.2	82.8	58.6
2022		100.0	100.0	100.0	65.5	77.0	66.3	53.4	70.7	81.7	72.3	55.3
Pacific Peoples												
2018	62.5	85.7	100.0	50.0	62.8	72.1	58.9	28.6	73.7	78.4	66.6	46.9
2019	91.7	100.0	100.0	80.0	61.8	71.3	60.3	30.3	70.9	80.6	67.5	42.7
2020	90.0	100.0	85.7	71.4	68.2	77.1	68.9	33.7	61.3	83.2	75.3	51.2
2021	88.9	100.0	81.8	72.7	62.3	71.5	64.9	33.0	61.2	78.7	71.3	44.8
2022	60.0	75.0	50.0	40.0	56.6	67.3	59.4	28.7	55.1	79.0	71.9	47.8

Appendix B NCEA Data from Kamar Example

The reports, created by the student management system Kamar, give detailed subject specific data. However, they are static reports and lack the ability to drill down into the information, to compare different variables or investigate different breakdowns, such as teacher or particular student groupings. The following tables and figures have been sourced directly from the markbook section of Kamar.

The first table is a breakdown by gender and ethnicity of the level of achievement of students for a particular standard. The example shown here is a single mathematics level 2 standard across the entire school. The comparison columns included are showing national and the average of schools with the same decile rating. All the figures are in percentages.

Summary NCEA Statistics by Standard

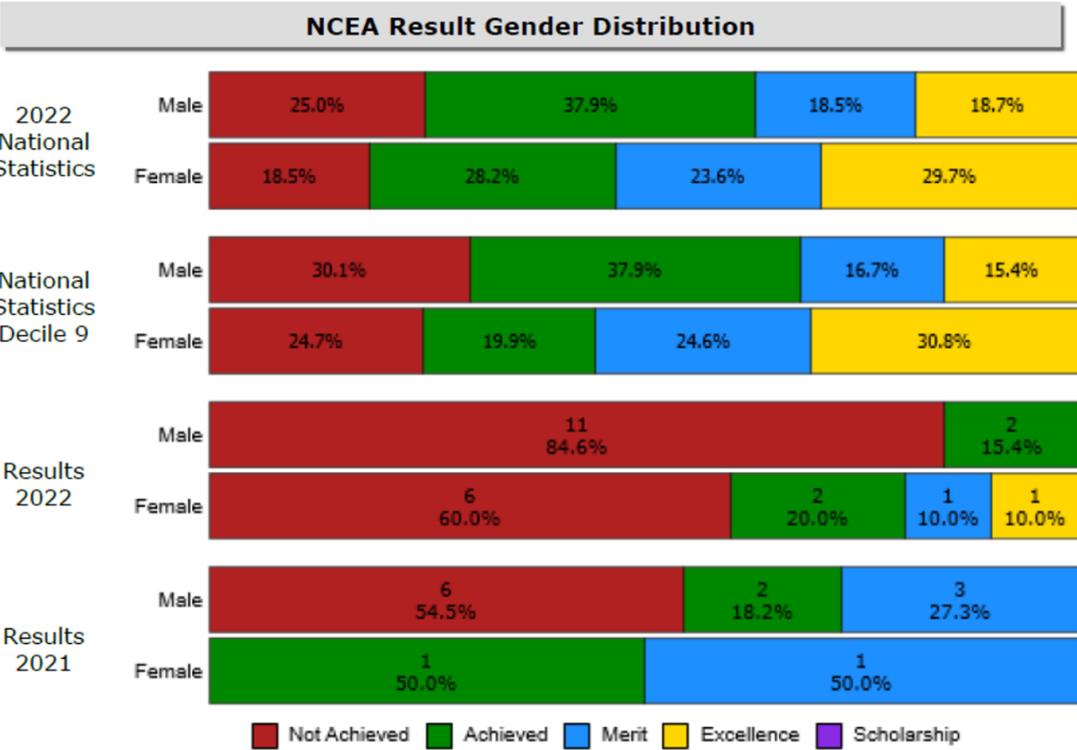
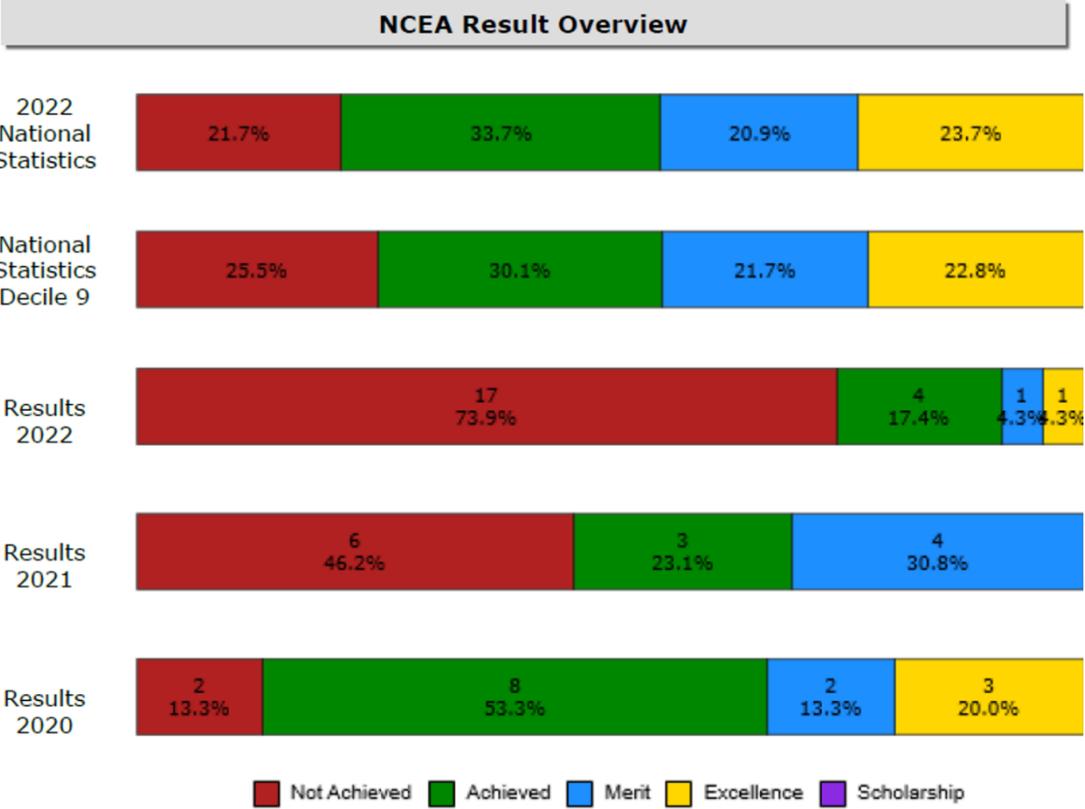
91259		Mathematics and Statistics 2.4 - Apply trigonometric relationships in solving problems												
Label	Total	Not Achieved			Achieved			Merit			Excellence			
		School	NS	Decile	School	NS	Decile	School	NS	Decile	School	NS	Decile	
Male	35	0	13.1	11.2	2.9	38.4	33.9	40	26.8	29.8	57.1	21.8	25.1	
Female	31	0	8.8	6	0	34.3	25.1	32.3	30	36.1	67.7	26.9	32.8	
European	36	0	10.9	9.5	2.8	35.1	30.6	41.7	29.5	32.7	55.6	24.5	27.2	
Maori	1	0	16.6	15	0	45.1	37	0	25	29.2	100	13.3	18.8	
Pasifika	1	0	16.3	11	0	52.5	42.8	100	20.6	34.7	0	10.7	11	
Asian	25	0	6.8	4.2	0	27.2	23.1	28	29.7	34.7	72	36.3	38.1	
MELAA	2	0	0	0	0	0	0	50	0	0	50	0	0	
Other	1	0	12.1	9.3	0	38.7	44.4	0	27.9	27.8	100	21.3	18.5	

The second table gives a breakdown of the total credits gained by students delineated by class teacher. This is a summary of the entire number of credits gained in the subject. This enables different teachers of the same subject to have their student results compared with other teachers.

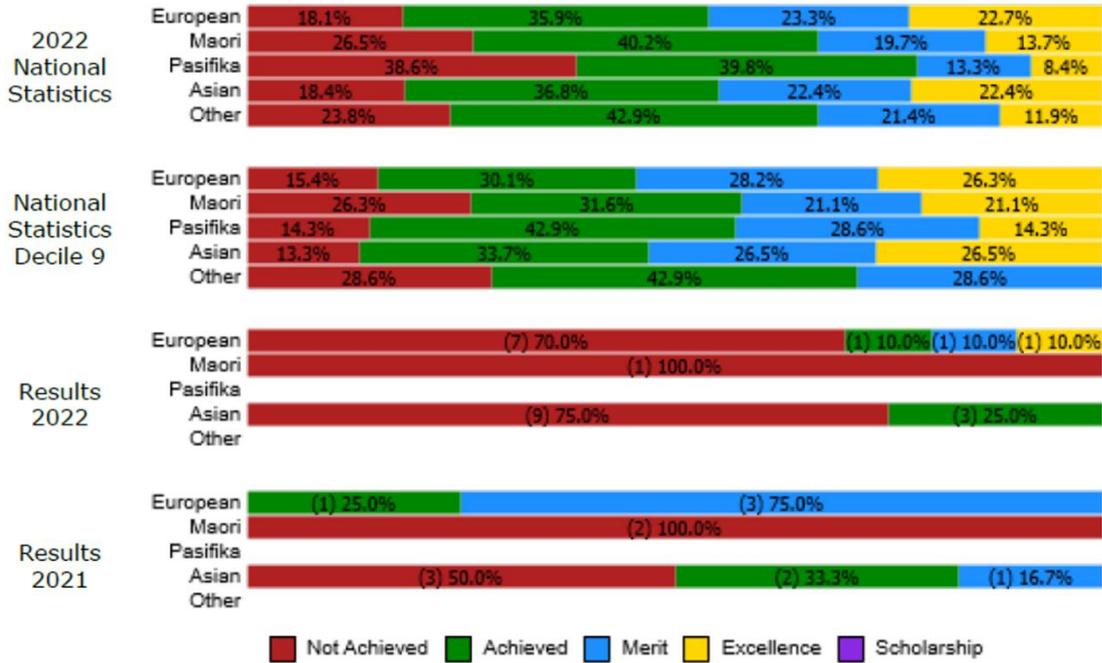
Summary NCEA Statistics by Teacher *(Sorted by Teacher)*

Teacher	Total % 14+cr	Students with Total Credits Earned																										
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25+	
	27 81%					1 4			1 4	1 4	1 4		1 4		2 7		1 4		17 63		2 7							
	20 80%						1 5		1 5				2 10		2 10			2 10		10 50		2 10						
	20 65%			2 10		1 5			1 5	1 5	1 5		1 5				1 5		11 55		1 5							
Total	70 73%	1 1		2 3	1 1	2 3		2 3	1 1	3 4	2 3	1 1	3 4	1 1	4 6	1 1	3 4		38 54		5 7							

The next three figures break down the level of achievement overall in the subject across multiple standards with a longitudinal comparison against both national figures and schools with the same decile rating. The second figure includes a gender comparison, and the third ethnicity. These are useful for identifying long term trends.



NCEA Result Ethnicity Distribution



The two following figures shows relationships. The first between attendance and credits achieved, the second between pastoral incidents and credits achieved. It is disaggregated by gender and ethnicity. It is a static report so individual students are not able to be identified.

Results 2022 - Achievement Standards



Appendix C Interview Protocol and Questions

The interview will begin with a few minutes of explaining the study, who I am, and the purpose of the study. The interviewee will be told that while the interview will be taped, their responses are to be kept strictly confidential. Also, if there is something they would like to say off tape, they can inform me and the recorder will be shut off for their comment. The approximate length of the interview will be specified at the beginning and the interviewee will be asked if they have any specific questions before starting.

Introduction

Thank you for agreeing to meet with me. I am conducting research on; to what extent and in what ways do secondary schools use NCEA achievement information to improve learning and achievement. In particular, I am interested in:

The challenges and obstacles that school leaders encounter in gaining insight into NCEA assessment information?

The leadership actions that enable schools to improve how they make use of NCEA assessment information?

This interview will cover different dimensions of leadership related to learning. There will be 7 questions, and it is expected to take approximately 30 - 45 minutes.

Interview Questions:

1. Why do you think it is important (or not) for a school to make use of NCEA assessment information?
2. How, and in what ways, does your school make use of NCEA assessment information?
Probes:
 - a. Take me through the process you would typically follow
 - b. Tell me about any specific people who lead what happens
 - c. Tell me about how achievement information is shared
3. Give me an example showing how and why NCEA assessment information has improved teaching and learning in your school.

4. Give me an example showing how and why NCEA assessment information has not improved the teaching and learning in your school.

5. How can school leaders influence the use of NCEA assessment information?
Probes:
 - a. Think of examples from the past, the current year and hopes for the future

6. Describe any challenges, obstacles or conflicts you or your school have encountered when using NCEA assessment information.

7. How is your school working to overcome these challenges, obstacles or conflicts?
Probes:
 - a. Tell me about any specific actions or strategies

Thank you for your time.

Appendix D Leadership actions coding framework

A1 Purpose

A2 Leadership Structure

A3 Data

A4 Analysis

A4-1 Outside companies

A5 Interpretation

A4-1 Senior Management

A4-2 Curriculum Leaders

A4-3 Teachers

A4-4 Students

A5 Action

A5-0 Disciplined Dialogue

A5-0-1 Students

A5-0-2 Teachers

A5-0-3 Senior Management

A5-1 Evidence based action

A5-1-1 Senior Management

A5-1-1 Curriculum leaders

A5-1-2 Teachers

A5-1-3 Students

A5-2 Professional Development

A5-3 Communication with community

A6 Future Focus

Appendix E Obstacles and challenges coding framework

C1 Technical ability

C2 Assessment Literacy

C2-1 Students

C2-2 Teachers

C2-3 Community

C3 Time

C3-1 Timeliness

C4 Reliance on key staff

C5 Ownership of data

C6 Inconsistent approach

C7 Accountability vs professional learning

C8 Itinerant students

C9 Data reliability and validity

C10 Tracking leavers progress

C11 Outside factors

C12 Individualization

C13 NCEA

C13 -1 Assessment vs Learning

C13 -1-1 Measuring improvement

C14 Data

C14-1 Access

C14-2 Amount

C14-3 Fragmentation

C15 Lack of Collaboration

C16 Workload and stress vs high expectations

C17 Creating Risk averse staff and students

Appendix F National Survey

Thank you for agreeing to participate in this survey. The purpose of this survey is to investigate how NZ schools are responding to the challenge of making optimum use of NCEA, Cambridge/IB results for improving learning and achievement.

All responses will be aggregated so no school, at any stage of the reporting of results, will be individually identifiable.

At any stage throughout this survey you can withdraw simply by exiting the survey before completion, as no answers will be saved prior to this stage.

Please understand that by pressing “submit” at the end of the survey that you are consenting to have your answers being used for the study.

Email address (if you would like a summary of the results of the project):

Before beginning the survey please fill out the demographic information below

School Type (drop down select menu)

State Integrated Independent

Co-ed Single sex boys Single sex girls

Decile (drop down select menu)

1 2 3 4 - 10

Secondary school Roll

(Numerical Box)

Position of the person completing the survey

Principal

Senior Management

Middle Management

Classroom teacher

Other please specify

Online Survey about optimum uses of NCEA/Cambridge/IB results

Please answer the questions below and tick the appropriate boxes as they relate to your school

1. Rate the level of **importance** that your school places on the **use** of NCEA (Cambridge/IB) results for improving learning and achievement?

No Importance	Low Importance	Moderate Importance	High Importance
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain your rating

2. Tick the **main purpose** of your school's use of NCEA (Cambridge/IB) results?

Only for Accountability	Mostly for Accountability	Even balance between Accountability and Professional Learning	Mostly for Professional Learning	Only for Professional Learning

Please explain your rating

3. Describe how your school uses NCEA (Cambridge/IB) results for improving learning and achievement.

4. Tick the level of **confidence** you have that your school is making **optimum use** of NCEA (Cambridge/IB) results for improving learning and achievement?

No Confidence	Low Confidence	Moderate Confidence	High Confidence
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain your rating

5. List the main **challenges** that schools face in making **optimum use** of NCEA (Cambridge/IB) results for improving learning and achievement.

6. List the main **actions** that schools can take to **help** make **optimum use** of NCEA (Cambridge/IB) results for improving learning and achievement.

7. List any **assistance or resources** that you know are **available** to help schools use assessment data to improve learning and achievement?

Appendix G Ethics information sheet for principals

School of Educational Studies and Leadership

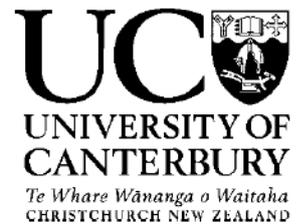
College of Education, Health & Human Development

University of Canterbury, NZ

Telephone: +64 3 9402000 ext 4087

Email: dean.mckenzie@pg.canterbury.ac.nz

Saturday, 4 February 2017



“More than just results: The role of school leaders in data use and interpretation”

Information Sheet - Principal

Dear

My name is Dean McKenzie; I am an Assistant Principal working in a New Zealand School currently studying for a Doctorate in Education through the University of Canterbury. My thesis intention is to investigate how New Zealand school leaders are responding to the challenge of making effective use of the summative assessment information available from the New Zealand Certificate of Educational Achievement (NCEA) school results. This has become a pressing issue for schools, as you will well know, as there is a growing expectation for these data to be used in the overall decision making processes, so that schools themselves can plan improvements to practice. The aim of this study is to not only identify leadership actions that are proven to be effective and to share them, but to also investigate if there any deficiencies highlighted in the system that need to be addressed moving forward. The ultimate goal being; to disseminate knowledge and leadership actions used by the case schools, to better understand the role that these leadership actions can play in *effective data use*. It is hoped that the findings will be relevant not just to secondary schools, but to the secondary sector as a whole.

You are invited to participate as a subject in this research project entitled “More than just results: The role of school leaders in data use and interpretation”. If you choose to take part in this study your involvement in this project will be to select two staff members, one who has primary responsibility for overseeing the use of NCEA data, the other a member of middle management who best exemplifies data use in your school. Along with yourself, each participant will engage in a semi-structured interview covering four dimensions of leadership related to learning, namely; professional development; conditions for learning; curriculum and teaching; and leadership. There will be six questions, and it is expected to take approximately 45 minutes. At these interviews, the interviewee will be requested to bring to the interview any documents that they use in the process of data use. The interviews will be recorded (audio) and transcribed, the documents will be analysed for structure, form, disaggregation and nature of data. The actual content (results/trends/etc) of the documents will not form part of the study. In addition to this, a questionnaire will be sent to the school to collect demographic and technical data to help give a richer description of the case study.

Participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will use my best endeavours to remove any of

the information relating to you from the project, including any final publication, provided that this remains practically achievable. The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public without your prior consent. To ensure anonymity and confidentiality, the study will make use of pseudonyms for both participants and schools. All data related to the study will be kept on a password protected external hard drive, with only myself as researcher and my University supervisors having access. This data will be destroyed after a period of 10 years.

A thesis is a public document and will be available through the UC Library. Please indicate to the researcher on the consent form if you would like a copy of the summary of results of the project.

The project is being carried out as a requirement for a Doctorate of Education (EdD) by Dean McKenzie, under the supervision of Associate Professor Susan Lovett and Dr John Boereboom, who can be contacted at susan.lovett@canterbury.ac.nz and john.boereboom@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Educational Research Human Ethics Committee, and participants should address any complaints to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (humanethics@canterbury.ac.nz).

If you agree to participate in the study, you are asked to complete the consent form and return in the enclosed prepaid envelope.

Dean McKenzie

Appendix H Ethics information sheet for management

School of Educational Studies and Leadership

College of Education, Health & Human Development

University of Canterbury, NZ

Telephone: +64 3 9402000 ext 4087

Email: dean.mckenzie@pg.canterbury.ac.nz

Saturday, 4 February 2017



“More than just results: The role of school leaders in data use and interpretation”

Information Sheet - Management

Dear

My name is Dean McKenzie; I am an Assistant Principal working in a New Zealand School currently studying for a Doctorate in Education through the University of Canterbury. My thesis intention is to investigate how New Zealand school leaders are responding to the challenge of making effective use of the summative assessment information available from the New Zealand Certificate of Educational Achievement (NCEA) school results. This has become a pressing issue for schools, as you will well know, as there is a growing expectation for these data to be used in the overall decision making processes, so that schools themselves can plan improvements to practice. The aim of this study is to not only identify leadership actions that are deemed to be effective and to share them, but to also investigate if there any deficiencies highlighted in the data management processes that need to be addressed moving forward. The ultimate goal being; to disseminate knowledge and leadership actions used by the case schools, to better understand the role that these leadership actions can play in *effective data use*. It is hoped that the findings will be relevant not just to secondary schools, but to the secondary sector as a whole.

You are invited to participate as a subject in this research project. Your school has been approached due to its reputation in the Education community as a school making good use of data. If you choose to take part in this study your involvement in this project will be to engage in a one on one interview covering four dimensions of leadership related to learning, namely; professional development; conditions for learning; curriculum and teaching; and leadership. There will be six questions, and it is expected to take approximately 45 minutes. At these interviews, the interviewee will be requested to bring to the interview any documents that they use in the process of data use. The interviews will be recorded (audio) and transcribed, the documents will be analysed for structure, form, disaggregation and nature of data. The actual content (results/trends/etc) of the documents will not form part of the study. In addition to this, a questionnaire will be sent to the school to collect demographic and technical data to help give a richer description of the case study.

Participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will use my best endeavours to remove any of the information relating to you from the project, including any final publication, provided that this remains practically achievable. The results of the project may be published, but you may

be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public without your prior consent. To ensure anonymity and confidentiality, the study will make use of pseudonyms for both participants and schools. All data related to the study will be kept on a password protected external hard drive, with only myself as researcher and my University supervisors having access. This data will be destroyed after a period of 10 years.

A thesis is a public document and will be available through the UC Library. Please indicate to the researcher on the consent form if you would like a copy of the summary of results of the project.

The project is being carried out as a requirement for a Doctorate of Education (EdD) by Dean McKenzie, under the supervision of Associate Professor Susan Lovett and Dr John Boereboom, who can be contacted at susan.lovett@canterbury.ac.nz and john.boereboom@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Educational Research Human Ethics Committee, and participants should address any complaints to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (humanethics@canterbury.ac.nz).

If you agree to participate in the study, you are asked to complete the consent form and return in the enclosed prepaid envelope.

Dean McKenzie

Appendix I Information email for principals

School of Educational Studies and Leadership
College of Education, Health & Human Development
University of Canterbury, NZ
Telephone: +64 3 9402000 ext 4087
Email: dean.mckenzie@pg.canterbury.ac.nz
Saturday, 14 October 2017



Information email - Principal

Dear

My name is Dean McKenzie; I am an Assistant Principal working in a New Zealand School currently studying for a Doctorate in Education through the University of Canterbury. My thesis intention is to investigate how New Zealand schools are responding to the challenge of making the optimum use of NCEA (Cambridge/IB) results for improving learning and achievement. The aim of this study is to not only investigate how schools are using NCEA (Cambridge/IB) results but also to identify actions that are deemed to be effective and to share them. It is hoped that the findings will be relevant not just to secondary schools, but to the secondary sector as a whole.

This email is to invite you and your staff to participate in this research project. If you choose to take part in this study your involvement in this project will be to complete an online survey (link provided below) which should take no longer than 10 minutes and to approach three other staff members, one from the Senior Leadership team, a Head of Department and a classroom teacher and invite them to do the same.

Participation is voluntary and all participants have the right to withdraw from the study at any time by simply exiting the survey, (responses are only saved at the completion of the survey). The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: all responses will be aggregated so no school, at any stage of the reporting of results, will be individually identifiable. All data related to the study will be kept on a password protected external hard drive, with only myself as researcher and my University supervisors having access. This data will be destroyed after a period of 10 years.

A thesis is a public document and will be available through the UC Library. Please indicate to the researcher on the survey form if you would like a copy of the summary of results of the project.

The project is being carried out as a requirement for a Doctorate of Education (EdD) by Dean McKenzie, under the supervision of Associate Professor Susan Lovett and Dr John Boereboom, who can be contacted at susan.lovett@canterbury.ac.nz and john.boereboom@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Educational Research Human Ethics Committee, and participants should address any complaints to The

Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (humanethics@canterbury.ac.nz).

If you agree to participate in the study, please complete the online survey which can be accessed by clicking the link below.

Yours sincerely

Dean McKenzie

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