Teachers as data navigators

Using data to improve teaching and learning

Mohamed Alansari, Natalie Campbell, and Bronwyn Gibbs

NZCER
Rangahau Mātauranga o Aotearoa

Rangahau Mātauranga o Aotearoa | New Zealand Council for Educational Research
Te Pakokori
Level 4, 10 Brandon St
Wellington
New Zealand

www.nzcer.org.nz

https://doi.org/10.18296/rep.0101

Teachers as data navigators

Using data to improve teaching and learning

Mohamed Alansari, Natalie Campbell, and Bronwyn Gibbs

2026

NZCER
Rangahau Mātauranga o Aotearoa

Mihi | Acknowledgements

"Teachers as Data Navigators" is part of NZCER's Te Pae Tawhiti Government Grant programme of research, funded through the Ministry of Education. We would like to thank Sue McDowall as the project sponsor and Mengnan Li for her support with survey design and sampling.

We are appreciative of all the principals and teachers who gave feedback during the pilot phase of the project, and to all participating schools for taking part in this research.

He ihirangi | Contents

Executive summary

"Teachers as Data Navigators" is part of NZCER's Te Pae Tawhiti Government Grant programme of research, funded through the Ministry of Education. The purpose of this study was to provide a national snapshot of primary and intermediate teachers' data capabilities, and to understand how schools use data when making decisions aimed at improving teaching, learning, and equity. The research question that guided our study was: How do primary and intermediate teachers perceive their data capabilities and their use of data when making decisions about improving teaching and learning?

A total of 971 teachers from across 263 primary and intermediate schools took part in our study. The survey focused on their views and practices across five key areas: data infrastructure and support; data literacy; data scrutiny; data discussions; and data outcomes.

Overall, teachers were positive about the functionality of the data systems they accessed. They also reported generally positive views of their data literacy. Teachers were most positive about their use of data for instructional decision making (90–95% agreement).

Whereas over 90% agreed or strongly agreed that they were confident understanding what their data say about student achievement, only 76% agreed or strongly agreed that they knew how to compare the outcomes of different groups of students (e.g., by gender or ethnicity).

The area rated least favourably by teachers was their data discussions, and specific aspects of their data-driven collaborative practices. Overall, there was higher agreement (64–75% agree or strongly agree) with items related to general discussions about data, such as having regular and useful team discussions focused on data analysis and interpretation. But there was less agreement (37–50%) with items related to formal or structured opportunities to have data-driven discussions, such as allocated time dedicated to discussing data and inequities shown in student data. Just over a third of teachers (37%) agreed or strongly agreed that their school had protocols or checklists for having productive discussions about their data.

Teachers were generally in agreement that the data gathered and used in their school is clearly aligned with their school's strategic goals (80%). Most teachers also considered their data to be sufficient for understanding and improving students' achievement, progress over time, and learning and wellbeing needs (84–89% agreement).

The qualitative findings highlighted that most teachers saw equity as a quality or an ideal that they worked towards throughout their practice. One group of teachers described equity as responding to diversity and "different" student needs, whereas another described it as achieving "equality" or "sameness". In their open-ended comments, teachers also described a range of strategies and approaches they saw as improving equitable outcomes for their students. They emphasised the need for collaborative, critical, and triangulated approaches to data use to improve equitable outcomes for students.

In response to the above research question, we identified four key messages from across the quantitative and qualitative findings, and our review of the literature:

1. Teachers reported that they had the general capabilities needed to navigate their data and make data-informed decisions about improving teaching and learning.
2. More support is needed to develop teachers' in-depth understanding of how to analyse and discuss data.
3. The ways teachers define equity can shape how they look at their data and make provisions for students.
4. Strong data capabilities are driven by collaborative school cultures, where teachers are critical about data use, and draw on multiple data sources to inform their practice.

1. Introduction

About the project

"Teachers as Data Navigators" is part of NZCER's Te Pae Tawhiti Government Grant programme of research, funded through the Ministry of Education. It aligns with NZCER's Strategic Priority 1 "Improving equity in education" and Strategic Priority 5 "Transforming education in a changing world". It also aligns with the Government's education priority of "Greater use of data", to support schools develop a comprehensive, data-informed picture of what is happening in their contexts, while extending on their evaluative capabilities (Education Review Office [ERO], 2021).

By describing teachers as data navigators, we wanted to give effect to the notion of Whakatere Tōmua—Wayfinding. Whakatere Tōmua draws on concepts of wayfinding, the voyaging spirit, waka, and navigation as means to better understand how teachers navigate their way through data to make sense of their practice and to better cater for their students. The overall concept of navigation can be understood through the lens of the following whakataukī:

He moana pukepuke e ekengia e te waka.

A choppy sea can be navigated.

In this research project, we examined the ways primary and intermediate teachers reported navigating data gathered at their schools, including the ways they viewed data for improving teaching, learning, and equity. We begin this section with background research that informed the development of the project. Subsequent sections will describe our study method, findings, and discussion of key messages.

What do we mean by data capabilities?

We define data capabilities in this report as organisational expertise in, and readiness for, using data to inform and improve practice. This definition allows for thinking about teachers' individual skills and knowledge needed to use data (Cui et al., 2023), as well as school-wide resourcing and support needed for capacity building (Kerr et al., 2006; Marsh & Farrell, 2014), and the data management systems schools use to navigate data (Datnow & Hubbard, 2016).

The New Zealand Government introduced a data capabilities framework,[1] which includes 25 capabilities associated with expert use of public data. These capabilities focused largely on individuals' skills and knowledges, but also included capabilities around data systems, the value of data being gathered, as well as how people lead strategic discussions and enable others to make better use of their data.

As part of our review of the literature, we found that some studies used "data literacy" and "data capabilities" interchangeably. In this project, we see data literacy as one component of data capabilities.

1 https://www.data.govt.nz/toolkit/data-capability-framework/the-framework-by-capability

Background literature

The following sections introduce the background literature that informed our thinking about the study and how we conceptualised data capabilities.

We searched the literature to identify key concepts, ideas, or practices commonly associated with effective data use. We incorporated search terms such as "data capabilities", "data literacy", "data competencies", and "data use" alongside descriptive adjectives such as "strong", "effective", "evidence-based", and "high". We specifically reviewed the literature focusing on teachers and, where possible, prioritised studies that provided practical ideas or recommendations about what "good" data capabilities looked like in schools.

Five areas of data capability

We found that teachers' data capabilities are understood, or typically studied, through five key areas.[2] These are described below.

1. Data infrastructure and support

This area focuses on the reliability and fitness-for-purpose of the data systems or software that schools use to manage, track, and analyse their data. Studies in this area highlighted the importance of schools using data systems that allowed them to record and see their data overall and broken down by groups, as well as identify longitudinal patterns (Schildkamp & Kuiper, 2010).

Breiter and Light (2006) argued that investing in data infrastructure that is built from the real needs of schools, and is easy to access and navigate, could improve the precision of teachers' instructional decision making. Otherwise, they might struggle with using data systems or software that store their data in forms that are difficult to access, manipulate, or interpret. Wayman (2005) described this as a common challenge facing teachers and suggested three areas of support for teachers: professional development and support for using data systems; developing in-house data expertise within leadership teams; and ongoing opportunities for collaboration and sharing data expertise.

2. Data literacy

Educational data literacy is the most researched area within the topic of data capabilities. It is typically defined as teachers' skills and knowledge related to making sense of their own data (i.e., examining, interpreting, and evaluating data) and using these for decision making and determining next steps (for a review of definitions, see Cui et al., 2023). Key technical skills or areas often associated with data literacy are foundational statistics, data representation and visualisation skills, as well as foundational knowledge related to data and sampling bias (Means et al., 2011).

The literature describes teachers with strong data literacy as those possessing strong technical skills and knowledge to make sense of their data, as well as the analytical skills needed to manipulate and analyse the data. There is value in developing teachers' data literacy as part of their pre- and in-service professional learning, so that data analysis is seen as integral to their practice (Caingcoy, 2020; Cowie & Cooper, 2019; Wong, 2019). Key data concepts and skills recommended as part of that professional learning include locating relevant data in tables or graphs, comprehending different representations of data, interpreting what different forms of data mean, and asking questions of the data to elicit insights or further queries (Means et al., 2011).

2 These five key areas were not often investigated altogether in the literature. Therefore, we could not find literature highlighting whether teachers excel in some or all of these, and/or whether certain areas are more/less critical for growing data capabilities.

3. Data scrutiny/data-driven instructional decision making

This area of the literature focuses on the precision and depth of questions, both technical and instructional, teachers ask to carefully examine their data and to draw inferences or insights about their practice. Through data scrutiny, teachers shift the focus from asking questions about what the data say about student progress to what it means for improving their practice (National Forum on Education Statistics, 2024).

The literature highlights how data scrutiny and data-driven instructional decision making is a core part of teacher practice. A review of the literature identified five common ways teachers used their classroom data: assessing student progress and identifying strengths and needs; planning next steps and goal setting with students; improving instruction; identifying groups of students with behavioural or social problems; and drawing on the data for communicating with parents about their children's learning and progress (Sun et al., 2016). The literature also highlights the need for teachers to be familiar and comfortable with using multiple sources or types of data to draw rich insights on student learning and to determine next steps (Sharma & Giannakos, 2020).

We found that effective data-driven instructional decision making relies on teachers knowing what to do with the insights or trends identified from their data. Aotearoa New Zealand research emphasised the importance of supporting teachers to analyse their data to identify solutions and next steps (Edwards & Cowie, 2024, 2025) and to make robust judgements about their practice (Lai et al., 2010; Schildkamp et al., 2013).

4. Data discussion/data-driven collaborative practice

The fourth area of data capability we identified is data discussions, or data-driven collaborative practice. The literature highlights the importance of teachers working collaboratively in various teams or groups, including the use of professional learning communities, to facilitate better use and analysis of data and to develop actionable next steps (Sun et al., 2016). The frequency and quality of these discussions could add value to teachers' practice, facilitating collective sense making of data and leveraging collective expertise (Bertrand & Marsh, 2015), allowing teachers to make the most of their data for instructional decision making (Lai et al., 2025).

The literature in this area cited above pointed to the importance of protecting teachers' time, or allocating dedicated time slots, for them to discuss their data. Other recommendations in prior studies included leveraging middle leadership expertise to drive pedagogical team discussions of the data, as well as the use of discussion frameworks, checklists, or protocols that guide teams through that process (Means et al., 2011; National Forum on Education Statistics, 2024). Previous research indicated that such resources can be valuable for transforming complex or "fuzzy" conversations into focused and critical dialogue between teachers (Woodland et al., 2024).

5. Data outcomes/strategic alignment

One of the areas that distinguish data capabilities from data literacy is teacher perceptions about, or attitudes towards, the strategic purpose or value of the data used at their school (Hoogland et al., 2016). This also includes the evaluative judgements schools make about the extent to which their data are useful for achieving school-wide goals.

Having clearly established or agreed upon goals that guide the way schools examine their data keeps a sharp focus on key improvement areas and allows teachers to see the line of sight from the data gathered through to the improvement initiatives implemented (Schumacher & Ifenthaler, 2025).

Teachers who saw the strategic and utility value of their data, and how that connected to improving their practice, reported feeling more efficacious and positively motivated about their data use (e.g., Grabarek & Kallemeyn, 2020; Wurster et al., 2023).

The current study

In this study we bring together the five key areas described above to explore the current state of data capability in Aotearoa New Zealand schools. The lack of existing instruments that measured teacher views and practices in the above areas prompted us to develop a new, self-report survey of data capabilities informed by the literature. The next section describes how we carried out the research using that survey.

2. Method

Design and approach

We undertook an exploratory quantitative design using self-report surveys. Our aim was to explore teachers' reported data capabilities and reported use of data to improve equity in their contexts. We were guided by the following research question: How do primary and intermediate teachers perceive their data capabilities and their use of data when making decisions about improving teaching and learning?

Participants

A total of 971 teachers from across 263 primary and intermediate schools took part in our study. Tables 1–2 below show the demographic breakdown of teacher respondents.

TABLE 1. **Demographic breakdown of teacher respondents (*n* = 971)**

Demographic category	Percentage (%)
Ethnicity	
NZ European	69
Māori	18
Asian	9
Pasifika	8
Other European	4
Prefer not to say	2
Years of teaching experience	
5 years or less	22
6–15 years	30
More than 15 years	48
Highest leadership responsibilities	
None/teaching only	61
Middle leadership	25
Senior leadership	14

Note: Ethnicity percentages do not add up to 100% due to multiple selection.

TABLE 2. **Demographic breakdown of participating schools (*n* = 263)**

Demographic category	Percentage (%)
School type	
Full primary (Y1–Y8)	43
Contributing (Y1–Y6)	45
Intermediate (Y7–Y8)	12
EQI band	
Fewer barriers	38
Moderate barriers	33
More barriers	29
Rurality	
Urban	83
Rural	17
Region	
Auckland	39
Wellington	13
Canterbury	13
Waikato	9
All other regions	< 6% per region

Data collection instrument

We used an online self-report survey for the study, containing open and closed questions about teachers' data capabilities and views of equity-driven data practices. The survey captured demographic information about teachers and their schools to enable describing the overall sample.

Informed by the literature, the research team developed a longlist of Likert items that could be mapped onto five key areas:

1. Data infrastructure and support: The reliability and fitness-for-purpose of the data systems that schools use to manage, track, and analyse their data.
2. Data literacy: Teachers' ability to understand, analyse, interpret, and use their data to inform teaching and learning.
3. Data scrutiny/data-driven instructional decision making: How teachers examine their data and draw inferences or insights about their practice.
4. Data discussion/data-driven collaborative practice: The extent to which staff collaborative practices enable effective discussion and use of the data.
5. Data outcomes: Strategic alignment between data gathered and the ways these are used to improve teaching and learning.

We piloted the longlist of Likert items with teachers and school leaders in several primary schools, made changes to these based on school feedback, and selected 37 for use in the survey. The piloting process ensured that all questions would be relevant to teachers' data practices and easy to understand and complete by respondents.

Because the survey was newly developed, we examined the factorial structure of the survey through exploratory factor analysis before proceeding with the main analysis (see Appendix). Of the 37 items, five items did not load uniquely on the five factors, so we have presented these separately at the end of the Quantitative findings section.

We scored all Likert items on a 1–5 agreement scale, and these are shown as part of the Findings in Figures 1–6.

The survey also included two open-ended questions:

1. Thinking about the quantitative data collected at your school, what does "equity" mean for you?
2. Is there anything else you would like to say about data use in your school?

Data collection

To recruit participants, we randomly selected a nationally representative sample of primary and intermediate schools, stratified by Schooling Equity Index (EQI) band, to take part in the study. We over-sampled schools from higher EQI bands to ensure greater representation of schools who might face greater barriers to achieving equitable outcomes. We also over-sampled schools with higher proportions of Māori and Pacific students.

Once schools were identified, we contacted school principals to invite their teachers to take part in the study. We provided principals with details about the study including an online survey link for them to pass on to their teachers. In total, we contacted 725 school principals, and 263 of these forwarded our invitation to teachers. We kept the survey open for 4 weeks during Term 4. After closing the survey, we sent schools with more than five teacher responses an aggregate summary report.

Data analysis plan

We coded all responses into Excel and SPSS and did preliminary checks of the data to ensure reliability and validity prior to the main analyses.

We carried out an exploratory factor analysis (including Cronbach's alpha and Pearson's *r* coefficient) to investigate potential underlying patterns in teacher responses and whether these aligned with how we conceptualised the survey. Item descriptives are shown in the Findings section. We did not disaggregate responses to the Likert items because, except for leadership roles, we found no statistically significant differences in survey responses by teacher or school demographics.

Responses to the two open-ended questions were analysed through thematic coding. Two researchers developed a shared codebook that they used to thematically code the data and to establish inter-rater reliability.

We analysed the qualitative data of kaiako Māori separately, to examine whether they reported unique perspectives and/or experiences that needed to be brought to the fore. Broadly speaking, kaiako Māori perspectives and experiences were qualitatively similar to those of non-Māori teachers. Where there were unique insights or culturally specific points of view, we have signalled as part of the findings.

3. Teachers' views of their data capabilities

This section presents the quantitative findings of the survey, organised into five key areas[3] that were identified from the literature review. Our factor analysis established the reliability of these five factors (see Tables A1–A2 in the Appendix) underpinning teacher responses to the survey:

1. Data infrastructure and support
2. Data literacy
3. Data scrutiny/data-driven instructional decision making
4. Data discussions/data-driven collaborative practice
5. Data outcomes/strategic alignment.

Data infrastructure and support

Overall, teachers were positive about the functionality of the data systems they accessed. Most teachers (89%) agreed or strongly agreed that their school uses a data system that allows navigating data longitudinally and most (86%) agreed or strongly agreed that these systems allow navigating class-level data overall and broken down by groups such as by ethnicity or gender (Figure 1).

Over two-thirds of teachers were positive about the ease of using their school's data systems and the support available to do so: 73% agreed or strongly agreed that they have access to expert support; 70% agreed or strongly agreed that their data systems or software are easy to use; and 69% agreed or strongly agreed that they have a person on-site to support them with troubleshooting.

Less than half of teachers (41%) agreed or strongly agreed that they received useful professional learning and development (PLD) on how to access their data systems.

3 We found a statistically significant positive association ($r = .20$, $p < .001$) between teachers' views of their data capabilities and their highest leadership responsibilities (i.e., teachers with senior leadership responsibilities were more positive about their data capabilities than those with middle or no leadership responsibilities).

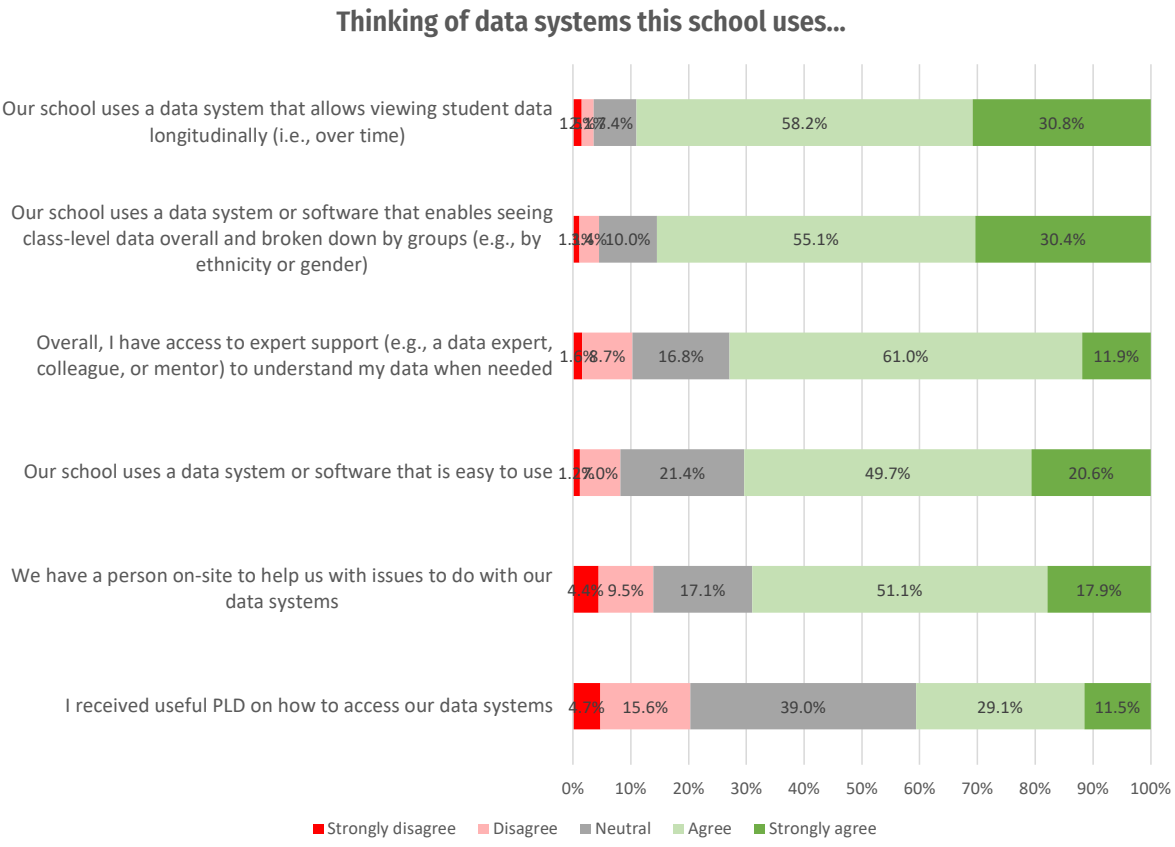

FIGURE 1. **Teacher responses to the items related to data infrastructure and support (n = 971)**

Data literacy

Teachers were generally positive about having the knowledge and skills needed to analyse, interpret, and evaluate their data (Figure 2).

Interestingly, over 90% agreed or strongly agreed that they were confident understanding what their data say about student achievement, yet only 76% agreed or strongly agreed that they knew how to compare the outcomes of different groups of students (e.g., by gender or ethnicity). One explanation is that teachers have more experience and are more confident using class-level data for assessing student progress than looking at factors such as ethnicity and gender.

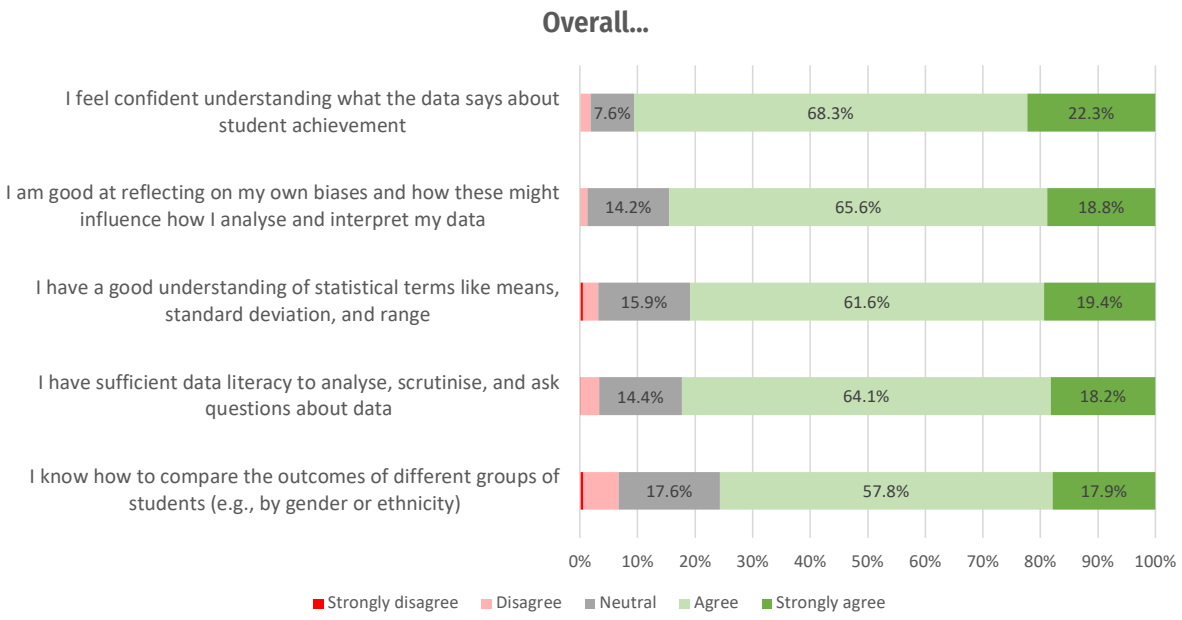

FIGURE 2. **Teacher responses to the items related to their data literacy (*n* = 971)**

Data scrutiny/data-driven instructional decision making

Teacher ratings of items related to their use of data for instructional decision making had the highest agreement levels, ranging from 90–95% (Figure 3).

Interestingly, teachers were 6 percentage points more likely to strongly agree that they had used data to identify who or which group of students needs support (29%) than to identify who or which group of students is doing well (23%).

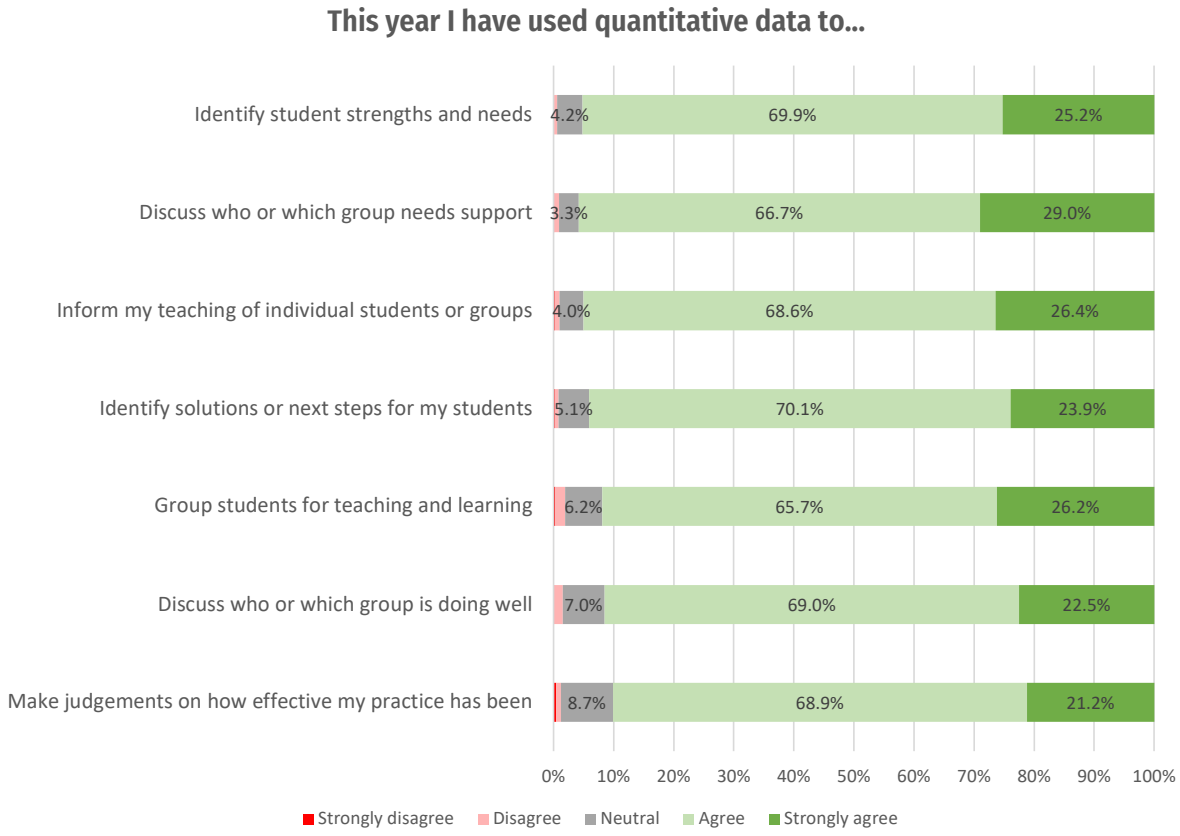

FIGURE 3. **Teacher responses to the items related to their data scrutiny practices (*n* = 971)**

Data discussions/data-driven collaborative practice

Figure 4 below shows that the area rated least favourably overall by teachers was their data discussions, and aspects of their data-driven collaborative practices.

Overall, there was higher agreement with items related to peer or team discussions about data (64–75% agree or strongly agree with the first three items in Figure 4) than items related to whole-staff or team meeting discussions about data (50% agree or strongly agree with items 5 and 6 in Figure 4). Fewer teachers (37%) agreed or strongly agreed that their school had protocols or checklists for having productive discussions about their data.

Sixty-one percent of teachers agreed or strongly agreed that they regularly share data with students and whānau for discussion.

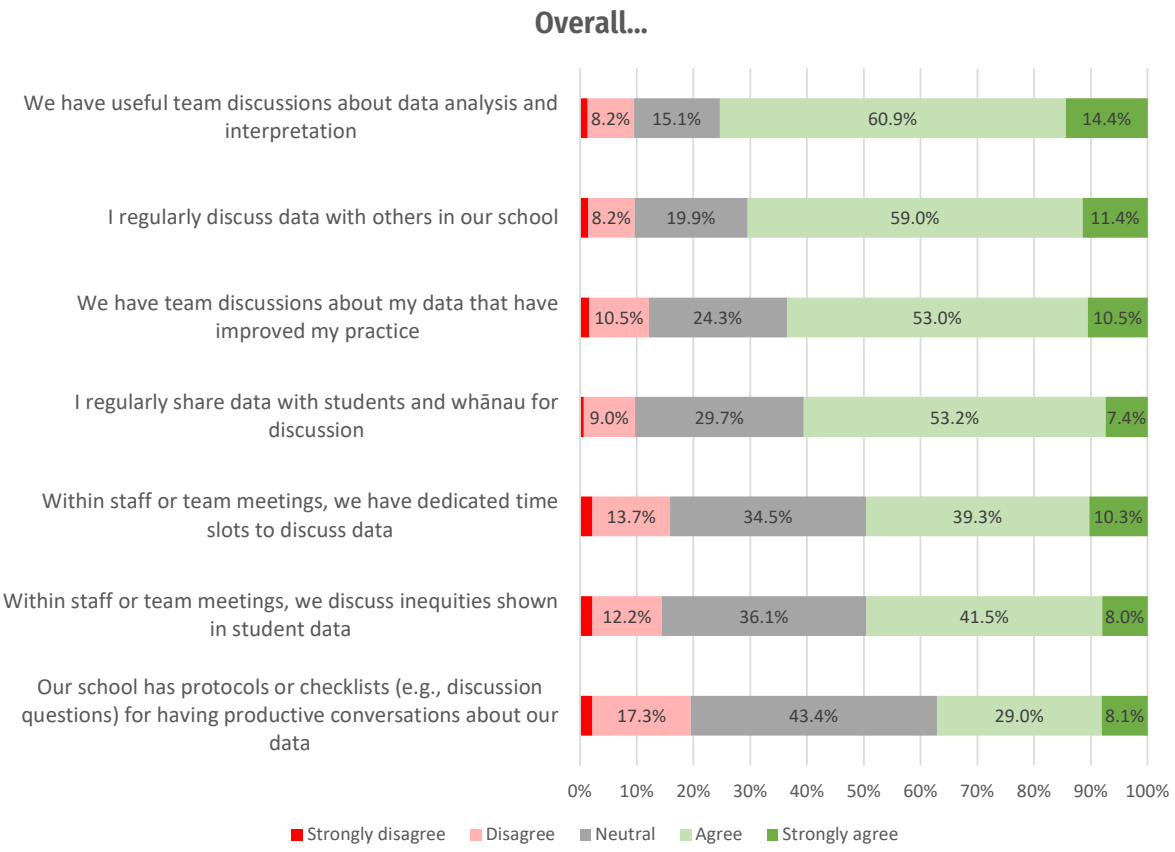

FIGURE 4. **Teacher responses to the items related to their data discussions (*n* = 971)**

Data outcomes/strategic alignment

As shown in Figure 5, teachers were generally in agreement that the data gathered and used in their school are clearly aligned with their school's strategic goals (80%). Most teachers also considered their data to be sufficient for understanding and improving students' achievement, progress over time, learning, and wellbeing (84–89% agreement).

Of all teachers, 79% agreed or strongly agreed that their data are important for understanding what equitable outcomes look like for their school (18% were neutral, and 3% disagreed or strongly disagreed).

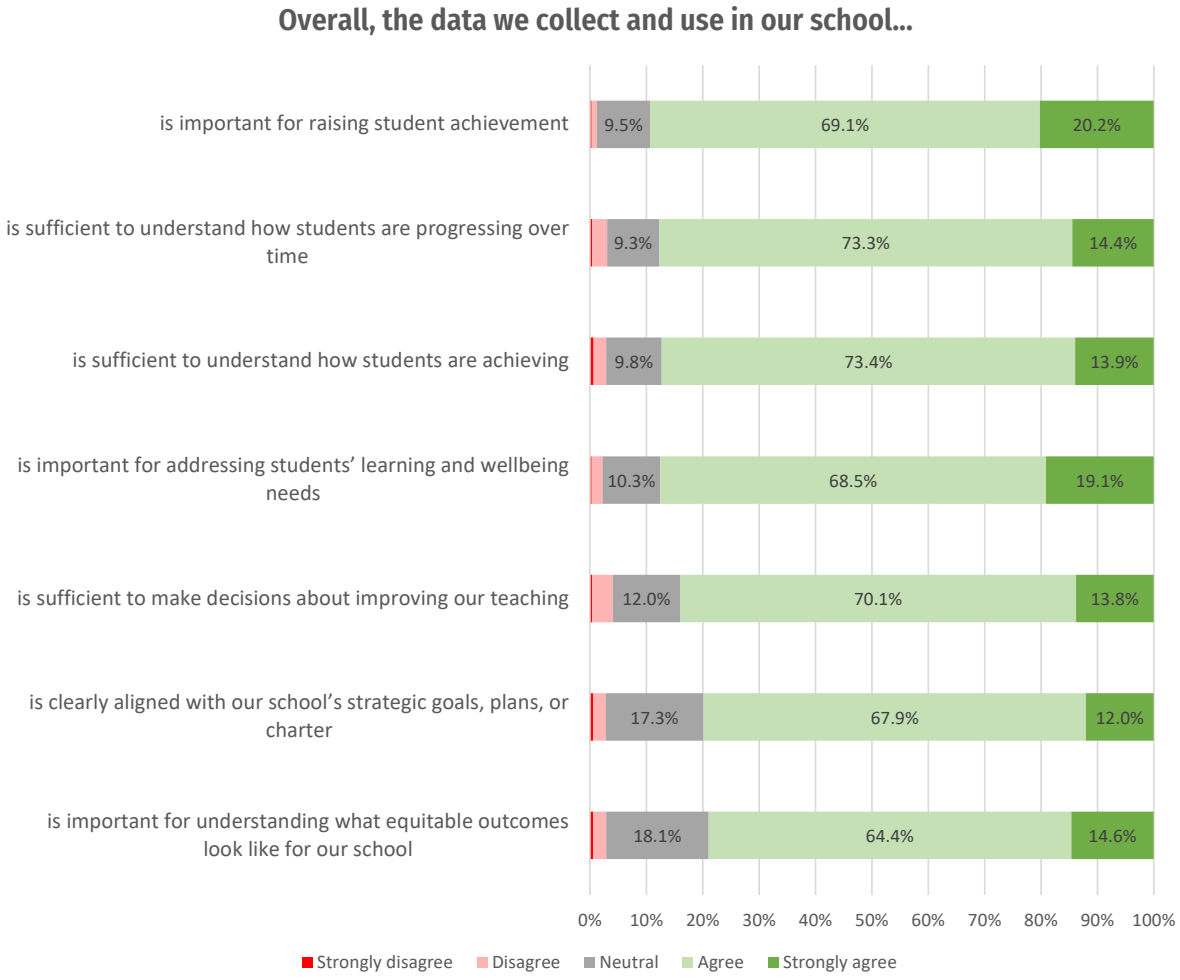

FIGURE 5. **Teacher responses to the items related to data outcomes (*n* = 971)**

Other findings

Whilst items in Figure 6 below did not fit into the five main factors, they do provide relevant information and context.

Most teachers agreed or strongly agreed with feeling confident understanding what the data say about students' progress over time (88%) and that school data inform the resourcing of teaching and learning. However, over one-third of the teachers (36%) agreed or strongly agreed that the data collected in their school are used more for reporting purposes than improving teaching.

Only 37% agreed or strongly agreed that they have access to useful PLD opportunities to develop their data literacy.

Using AI for analysing and understanding quantitative data was the least agreed with item in the survey (20% agreement).

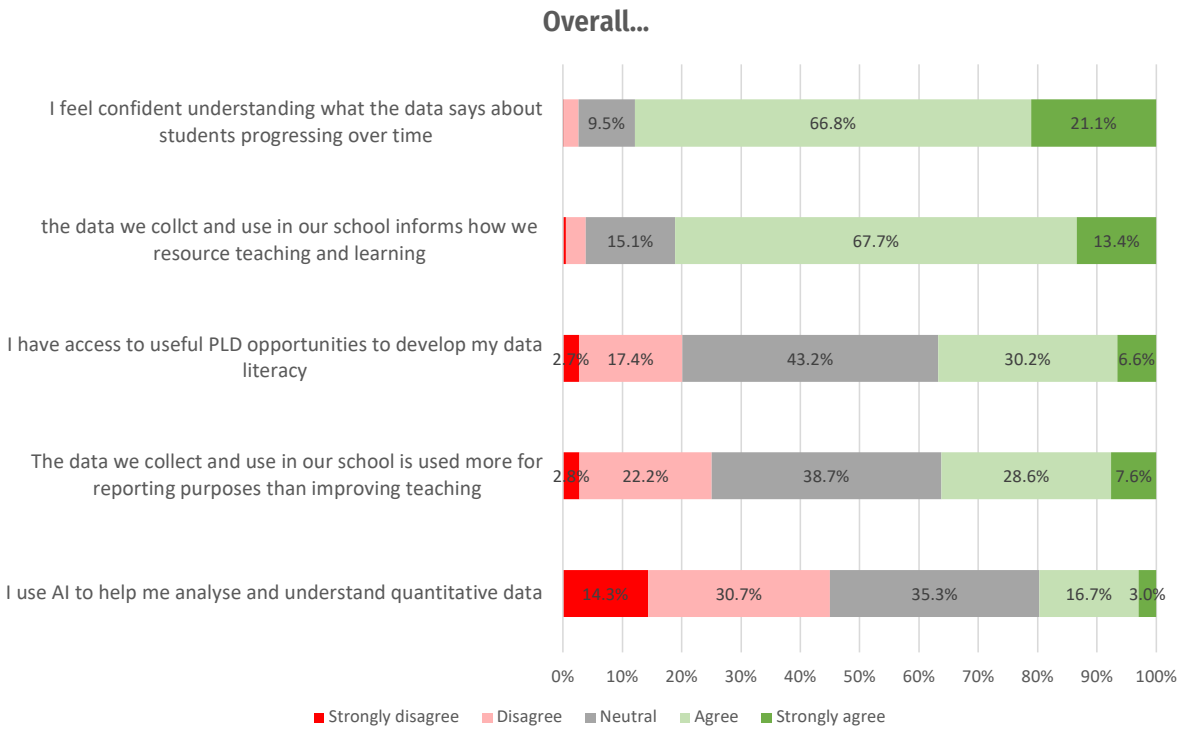

FIGURE 6. **Additional survey items (*n* = 971)**

Summary of key findings

- Most teachers were positive about the functionality of the data systems they accessed.
- Teachers perceived themselves to be strongest in relation to data scrutiny and their use of data for instructional decision making.
- Teachers tended to rate their general data literacy and data discussions positively, but were less positive about the data capabilities needed for understanding equitable outcomes (e.g., having the analytical skills needed to compare outcomes of subgroups, having team discussions about inequities shown in student data, accessing protocols for having productive discussions about the data, and collecting school-level data that enable understanding what equitable outcomes look like).
- Less than half of teachers reported receiving useful PLD or support on how to access their data systems and to develop their data literacy.

4. How do teachers navigate equity and data in their contexts?

This section presents the findings from our qualitative analysis of the 716 responses to the two open-ended survey questions. These questions were: 1) "Thinking about the quantitative data collected at your school, what does 'equity' mean for you?" and 2) "Is there anything else you would like to say about data use in your school?" First, we provide an overview of the key ideas and themes identified from the data, followed by a description of each theme with representative teacher quotes.

In response to the first open-ended question, teachers highlighted the ways they viewed equity, the teaching strategies and approaches they used to understand and promote equitable outcomes, and the influencing factors (individual, local, and systemic) they recognised as contributing to fewer/greater inequities. For the second open-ended question, teachers focused on their own data practices and their views of data use at their school.

Teachers navigating/operationalising equity in their contexts

This section focuses on teacher responses to the first open-ended question, and highlights how teachers view equity, how it is operationalised in schools, and what they perceive as factors influencing equity. Responses highlight that:

1. teachers had varied understandings of what equity means
2. teachers are aware of the in- and -out-of-school influences on achieving equity
3. kaiako Māori viewed equity as closely related to their teaching.

Teachers had varied understandings of what equity means

Most teachers (*n* = 569) discussed equity as a quality or an ideal that they worked towards throughout their practice.

Teachers tended to view equity in one of two ways: 1. Equity as responding to difference or 2. Equity as ensuring same or equal opportunities. One group of teachers (*n* = 382) described equity as an ideal reached through responding to the different needs of learners. To those teachers, equity was about recognising diversity and looking beyond fairness. In doing so, teachers recognised that "different" or "unequal" provisions—relative to student needs—may be necessary to achieve equitable outcomes:

> Equity is realising that fairness isn't about treating all students the same but understanding the different levels of support needed to experience success. It's about understanding the causes for students not achieving at the same rate as others. (Teacher 636)

> [Equity] does not mean equal and those who need it should get more support. (Teacher 476)

> For me, equity means using our data to give each learner what they specifically need to succeed. Our results show varied starting points, attendance patterns, and learning progress, so equity isn't equal treatment—it's targeted support. (Teacher 886)

> Knowing and supporting every student in having what they need to succeed. Some students need more support which might not mean every student is getting 'equal'. Realising that each learner is different and being able to look past the figures and look at possible barriers for that child. (Teacher 112)
>
> Equity means that a student's outcomes and opportunities are not predictably linked to their social or cultural background (e.g., socioeconomic status, race, gender, family background, or disability). It focuses on providing each student with the specific resources and support they need to reach their full potential, rather than giving every student the exact same treatment or resources (equality). (Teacher 31)

Another group of teachers (*n* = 187) described equity as being achieved through equalising. Through this perspective, equity is enacted by providing the "same" or "equal" opportunities, ensuring all students are given similar provisions for learning. This group of teachers often used terms like "fairness", "sameness", or "equality" when describing equity:

> All students are given the same opportunity to a fair education. (Teacher 263)
>
> Being fair—give the same opportunities and the same parameters, allowing conditions to address existing inequities. (Teacher 142)
>
> Making sure that all students have equal opportunities to improve and succeed and are looked at with equal potential. (Teacher 807)

Teachers are aware of the in- and out-of-school influences on achieving equity

Many teachers (*n* = 369) described how they were improving equitable outcomes for their students. To those teachers:

> It's about removing barriers, allocating resources proportionately, and responding to the evidence of who needs more so every tamaiti has a fair chance to thrive. (Teacher 886)

Some of their responses (*n* = 112) also highlighted awareness of the in- and out-of-school factors that impact the needs of their students—including systemic, contextual, and socioeconomic factors as shown in the quotes below. Teachers recognised the interplay of these factors and the need to address them as a part of navigating equity. They were also aware of data limitations, and how data such as test scores might not be sufficient to understand student experiences and needs:

> For me, equity means remembering that our data never tells the full story. It doesn't show the children who come to school hungry, the five tamariki carrying trauma, or the many who are still deeply affected. These realities sit behind every number. Equity means recognising these invisible barriers and understanding that their impact shows up in our data. It reminds us that some children need far more support, stability, love, and time than the data alone can ever show. (Teacher 257)
>
> Ensuring every student gets what they need to succeed, recognising that they start from different places due to factors like socioeconomic status, culture, or abilities, addressing individual needs. (Teacher 261)
>
> When we look at our quantitative data, equity shows up in how well we are meeting the needs of different groups of students—including those who may be historically underserved, those with learning support needs, and those who require additional extension or cultural responsiveness. Equity means noticing the gaps, understanding why they exist, and then putting targeted actions in place so all ākonga can make meaningful progress, feel valued, and access rich learning opportunities across the curriculum. (Teacher 424)

Kaiako Māori viewed equity as closely related to their teaching

Overall, kaiako Māori responses reflected similar patterns and themes to those seen across the wider dataset, making several references to the teaching and learning experiences in their classes that reflected their commitment to equity.

Notably, kaiako Māori made explicit reference to cultural and contextual considerations around equity, including Te Tiriti o Waitangi, dual-medium settings, and the role of whānau; for example, "identifying whose needs aren't being met … responding with support, honouring Te Tiriti o Waitangi" (Kaiako Māori, 878).

The following section turns to the second part of the qualitative findings, focusing on how teachers responded to the second open-ended question.

General comments about data use

This section focuses on teacher responses to the second open-ended question: "Is there anything else you would like to say about data use in your school?" The three themes in teacher responses are:

1. Teachers viewed effective data practices as driven by triangulated and equity-driven approaches to data use.
2. School-wide support for data practices, including PLD, is important.
3. Kaiako Māori reported being collaborative in their data practices, but mindful of their increased workloads as a result.

Teachers viewed effective data practices as driven by triangulated and equity-driven approaches to data use

Overall, teachers' responses (n = 282) demonstrate awareness of the varied forms of data they access, and how their skills in navigating these enable richer conversations about equity—for example, by recognising gaps, considering why these might exist, and then exploring next steps in teaching and learning in relation to what the data say about where inequities persist. Teachers also recognised the importance of drawing on various data sources to make informed decisions, and to give assurance that their teaching is impactful:

> We need diverse data to make informed conclusions and decisions. (Teacher 117)
>
> Quantitative data is essential for identifying and addressing inequities by providing measurable indicators. (Teacher 31)

Teachers indicated that the data they gather and use at their schools are valuable, and that these can promote and advance equity. Triangulation was highlighted as driving nuanced teacher understanding of what promotes equity:

> One 'test' does not necessarily show what one student can achieve or what factors influence their data. (Teacher 59)
>
> Our school values data highly. Many surveys are used to gather data/voice both with the school and community also. (Teacher 222)
>
> When we look at the numbers collected at school (achievement data, attendance rates, wellbeing surveys, behaviour data, etc.), equity means: Checking whether every group of students is able to succeed, not just the average. Looking for patterns—Who is doing well? Who is being left

> behind? Noticing gaps between groups (for example, gender, ethnicity, year levels, learning needs, socioeconomic background). Thinking about fairness—Are some groups missing opportunities or support? Using the data to decide what resources, teaching approaches, or support systems are needed so everyone has a fair chance to learn and thrive. (Teacher 625)
>
> Data is really useful, but it never tells the whole story on its own. It needs to be read alongside what we see in the classroom and hear from whānau and learners, so decisions stay human, not just numbers-driven. (Teacher 452)

The connection between equity and data is described by teachers in terms of equitable approaches to collecting, analysing, understanding, sharing, and acting on data:

> Are all children able to access the way data is collected? How do we make changes to collection to make it more equitable? Is the fact it might not be equitable taken into consideration enough when analysing the data? (Teacher 250)
>
> Thinking about the quantitative data we collect, equity basically means we're checking the numbers to make sure everyone's getting what they actually need to succeed, not just giving everyone the same stuff. We have to break down all our test scores, and even discipline referrals by things like race, income, or special ed status. If those groups have huge, persistent gaps in their outcomes, that tells us the system isn't equitable yet, and we need to use that data to deliberately put more targeted support and resources toward the students who are falling behind until those differences disappear. (Teacher 286)
>
> Equity means using data to support us understand what individual students need, rather than using it to label a student. (Teacher 26)

School-wide support for data practices, including PLD, is important

As part of their comments on data use, teachers (*n* = 237) described enablers to collecting, analysing, using, and sharing data equitably—as individual teachers and as part of a wider system. These enablers included knowledge and discussions about data in terms of what was collected and why, reliability and validity concerns, and using data for decision making:

> We are often questioning the validity and use of the assessment data we are collecting and seeking appropriate PLD to help teachers build capability in analysing the data that is collected. (Teacher 233)

Teacher responses also reflected contextual factors and PLD needs that contributed to their ongoing engagement with data—including their data literacy, whether/how they triangulate information with what they are hearing from learners and whānau, and system-wide factors:

> I would really like to understand how to compare data more especially with using scale scores. I would like to read data more fluently. (Teacher 636)
>
> The data use shouldn't just be about finding problems, it needs to be about action and transparency. It's not enough to just break down the numbers and see the equity gaps; we have to constantly be trying new things—new teaching methods, different resource allocations, purchasing resources that we need not what others think we need—and then immediately collecting the next set of data to see if those interventions actually worked to close the gap. (Teacher 286)
>
> I really love how our school is focused on using our data as more than a reporting tool. It informs our everyday teaching and we are constantly monitoring it to make sure we support ākonga achievement. (Teacher 545)

Teachers mentioned a few challenges to ongoing engagement with data, namely the lack of across-school discussions and the impact of curriculum changes on interpreting assessment data:

> We don't always know what is done and used in different parts of the school. Junior and senior data is quite separate. (Teacher 370)
>
> The current curriculum changes have made it difficult to understand where the benchmarks are, as the goal posts continue to change it is affecting how we assess students. (Teacher 295)
>
> Without systems embedded throughout the school, the reliability of the data depends on individuals' knowledge, time, and energy to prioritise data analysis rather than see it as a compliance task. (Teacher 47)

Kaiako Māori were collaborative in their data practices, but mindful of their increased workloads as a result

As noted earlier, kaiako Māori reported similar perspectives and views on data use to those seen across the wider dataset. They similarly emphasised data navigation as a collaborative process, and the need to support schools' data capabilities to ensure ongoing engagement with the data.

However, some kaiako Māori mentioned the time constraints and administrative workload associated with increased collaboration, particularly when kaiako were trying to manage multiple or overlapping assessment data sources.

Summary of key findings

- Most teachers defined equity as a quality or an ideal that they worked towards throughout their practice.
- One group of teachers described equity as responding to diversity and "different" student needs, whereas another described it as achieving "equality" or "sameness".
- Teachers described systemic, contextual, and socioeconomic factors that impact the needs of their students.
- A school-wide, collaborative approach is key to growing data capabilities.
- Effective and ongoing engagement with data involves drawing on multiple data sources, collecting data in equitable ways, recognising the strengths and limitations of different data tools, types, and/or sources, and acting on findings in ways that support equity.

5. Discussion

The purpose of this study was to provide a national snapshot of primary and intermediate teachers' perceptions of their data capabilities, and to understand how schools use data when making decisions aimed at improving teaching and learning. We were also interested in how teachers reported using data to improve equity in their contexts. The research question that guided our study was: How do primary and intermediate teachers perceive their data capabilities and their use of data when making decisions about improving teaching and learning?

In response to the above research question, we have four key messages from across the quantitative and qualitative findings and the research literature:

- Teachers reported that they had the general capabilities needed to navigate their data and make data-informed decisions about improving teaching and learning.
- More support is needed to develop teachers' in-depth understanding of how to analyse and discuss data.
- The ways teachers define equity can shape how they look at their data and make provisions for students.
- Strong data capabilities are driven by collaborative school cultures, where teachers are critical about data use, and draw on multiple data sources to inform their practice.

Teachers reported having the general data capabilities needed to make informed decisions about teaching and learning

Overall, teachers reported positive views of their data capabilities across the five areas we explored in the survey. Most were positive about the data systems they access as well as their general data literacy, data discussions, and the strategic alignment of the data being used at their schools. Teachers perceived themselves to be strongest in using their data for instructional decision making.

Teachers also showed awareness of the affordances and limitations of quantitative data, and the importance of data triangulation. Most of the current literature seems to focus on schools analysing single forms of data, such as student achievement (e.g., Sun et al., 2016), rather than data from multiple areas, including attendance or wellbeing data to make decisions about improving teaching and learning. Future studies could highlight the ways teachers analyse data from multiple areas and sources to inform their instructional decision making, and whether doing so collaboratively can improve that process.

We found that teachers with senior leadership responsibilities were significantly more positive about their data capabilities than those with middle or no leadership responsibilities. It is possible that those in leadership positions have opportunities to analyse school-wide data for reporting purposes that classroom teachers do not. Middle and senior leaders may be more accustomed to data discussions and comparing data of different groups of students as part of their data-reporting responsibilities. Previous research (Lee et al., 2024; Luo, 2008) had found that experienced leaders were more positive in their use of data, including data analysis and data-driven decision making, than novice leaders or ones with no data reporting responsibilities (see also Schildkamp et al., 2017).

More support is needed to develop teachers' in-depth understanding of how to analyse and discuss data

Teachers would benefit from additional PLD or support that allows them to engage more deeply with their data, as individuals and in teams. Our quantitative findings suggest that not all teachers reported having the technical skills needed to analyse data by groups (e.g., gender or ethnicity) or to discuss inequities shown in the data. While teachers described support for data analysis and data-driven collaborations as enablers to ongoing engagement with data, less than half reported receiving useful PLD or support to develop their data literacy. Supporting teachers in the above areas would likely enable better understanding of what equitable outcomes might look like at a class or school level and prepare them to engage with data at a deeper level (Dodman et al., 2023).

The ways teachers define equity can shape how they look at their data and make provisions for students

Teachers had different understandings of what equity means and looks like in their practice. For a larger group, equity was about responding to diversity, personalising instructional practices and opportunities to learn, to meet students' strengths and needs. For the other, smaller group of teachers, equity was about ensuring "sameness" or "equality".

Across the two groups, there was a general commitment to fairness but ideas about how to achieve this differed. It may be worthwhile for schools to develop a shared understanding, including common definition and language, of what is meant by equity,[4] especially if it influences how teachers resource or make provisions for students who face greater barriers to learning and achievement. A similar finding was found by Alansari et al. (2023), where schools had varied understandings of what "equity" and "equitable outcomes" mean in education. These different understandings of equity influenced how schools allocated resources to support teaching and learning.

Strong data capabilities are driven by collaborative school cultures, where teachers are critical about data use, and draw on multiple data sources to inform their practice

Our findings point to a few PLD areas or features that could support teachers' use of data. Teachers need to develop in-depth and critical understanding of the purpose of the data being gathered, including reliability and validity, and to be able to engage with varied forms of data to make tailored pedagogical decisions about supporting students (see also Mandinach & Schildkamp, 2021). Teachers need to possess the skills and knowledge needed to draw on multiple data sources, and to unpack what they see in the data through collaborative discussions with others in their school. Similar recommendations are echoed in other national (Lai et al., 2025) and international research (Means et al., 2011; Schildkamp, 2019), where effective data practices were predicated on teachers' critical, collaborative, and triangulated approaches to data use. Overall, ongoing investment in teachers' data capabilities can directly and positively impact student outcomes, as well as indirectly through improving schools' use of data for instructional planning and targeted support (Carlson et al., 2011; Visscher, 2021).

4 Several reviews and discussion papers address different understandings of the term "equity" and how to ground it in practice (e.g., Benadusi, 2001; Gilbert et al., 2011; Jurado de Los Santos et al., 2020; Levinson et al., 2022; OECD, 2018; Unterhalter, 2009).

References

Alansari, M., Turner-Adams, H., & Li, M. (2023). *Assessing how schools are responding to the Equity Index*. New Zealand Council for Educational Research. https://doi.org/10.18296/rep.0034

Benadusi, L. (2001). Equity and education: A critical review of sociological research and thought. *In pursuit of equity in education: Using international indicators to compare equity policies* (pp. 25–64). Springer Nature.

Bertrand, M., & Marsh, J. (2015). Teachers' sensemaking of data and implications for equity. *American Educational Research Journal, 52*(5), 861–893.

Breiter, A., & Light, D. (2006). Data for school improvement: Factors for designing effective information systems to support decision-making in schools. *Journal of Educational Technology & Society, 9*(3), 206–217.

Caingcoy, M. (2020). Research capability of teachers: Its correlates, determinants and implications for continuing professional development. *Journal of World Englishes and Educational Practices, 2*(5), 1–11. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3631867

Carlson, D., Borman, G., & Robinson, M. (2011). A multistate district-level cluster randomized trial of the impact of data-driven reform on reading and mathematics achievement. *Educational Evaluation and Policy Analysis, 33,* 378–398. http://doi.org/10.3102/0162373711412765

Cowie, B., & Cooper, B. (2019). Exploring the challenge of developing student teacher data literacy. In C. DeLuca & S. Johnson (Eds.), *Developing teachers' assessment capacity* (pp. 27–43). Routledge.

Cui, Y., Chen, F., Lutsyk, A., Leighton, J. P., & Cutumisu, M. (2023). Data literacy assessments: A systematic literature review. *Assessment in Education: Principles, Policy & Practice, 30*(1), 76–96. https://doi.org/10.1080/0969594X.2023.2182737

Datnow, A., & Hubbard, L. (2016). Teacher capacity for and beliefs about data-driven decision making: A literature review of international research. *Journal of Educational Change, 17,* 7–28. https://doi.org/10.1007/s10833-015-9264-2

Dodman, S. L., DeMulder, E. K., View, J. L. et al. (2023). "I knew it was a problem before, but did I really?": Engaging teachers in data use for equity. *Journal of Educational Change, 24,* 995–1023. https://doi.org/10.1007/s10833-022-09477-z

Education Review Office. (2021). *Internal evaluation as a catalyst for change*. Author.

Edwards, F., & Cowie, B. (2024). Pre-teaching or fresh choice each day: Teacher data literacy in action. *Set: Research Information for Teachers*, *3*, 20–24. https://doi.org/10.18296/set.1562

Edwards, F., & Cowie, B. (2025). Getting more out of what we've got: Talking about assessment data. *Set: Research Information for Teachers*, *3*, 42–46. https://doi.org/10.18296/set.1584

Gilbert, R., Keddie, A., Lingard, B., Mills, M., & Renshaw, P. (2011). Equity and education research, policy and practice: A review. In *Australian College of Educators national conference (Vol. 201, No. 1).* Australian College of Educators.

Grabarek, J., & Kallemeyn, L. M. (2020). Does teacher data use lead to improved student achievement? A review of the empirical evidence. *Teachers College Record, 122*(12), 1–42.

Hoogland, I., Schildkamp, K., van der Kleij, F., Heitink, M., Kippers, W., Veldkamp, B., & Dijkstra, A. M. (2016). Prerequisites for data-based decision making in the classroom: Research evidence and practical illustrations. *Teaching and Teacher Education, 60,* 377–386.

Jurado de Los Santos, P., Moreno-Guerrero, A. J., Marín-Marín, J. A., & Soler Costa, R. (2020). The term equity in education: A literature review with scientific mapping in web of science. *International Journal of Environmental Research and Public Health, 17*(10), 3526.

Kerr, K., Marsh, J., Ikemoto, G., Darilek, H., & Barney, H. (2006). Strategies to promote data use for instructional improvement: Actions, outcomes, and lessons from three urban districts. *American Journal of Education, 112*(4), 496–520.

Lai, M., Fjortoft, A., & Li, M. (2025). Improving how teachers discuss data for data-based decision-making. *Teaching and Teacher Education*, *155*, 104884. https://doi.org/10.1016/j.tate.2024.104884

Lai, M., McNaughton, S., & Hsiao, S. (2010). Sustaining improvements in student achievement: Myth or reality? *Set: Research Information for Teachers*, *1*, 10–17. https://doi.org/10.18296/set.0450

Lee, J., Alonzo, D., Beswick, K., Oo, C. Z., Anson, D. W., & Abril, J. M. V. (2024). Data literacy of principals in K–12 school contexts: A systematic review. *Educational Research Review, 45,* 100649.

Levinson, M., Geron, T., & Brighouse, H. (2022). Conceptions of educational equity. *Aera Open, 8,* 23328584221121344. https://doi.org/10.1177/23328584221121344

Luo, M. (2008). Structural equation modeling for high school principals' data-driven decision making: An analysis of information use environments. *Educational Administration Quarterly, 44*(5), 603–634.

Mandinach, E. B., & Schildkamp, K. (2021). Misconceptions about data-based decision making in education: An exploration of the literature. *Studies in Educational Evaluation*, *69*, 100842. https://doi.org/10.1016/j.stueduc.2020.100842

Marsh, J., & Farrell, C. (2014). How leaders can support teachers with data-driven decision making: A framework for understanding capacity building. *Educational Management & Administration, 43*(2), 269–289. https://doi.org/10.1177/1741143214537229

Means, B., Chen, E., DeBarger, A., and Padilla, C. (2011). *Teachers' ability to use data to inform instruction: Challenges and supports*. Report prepared for the U.S. Department of Education. www2.ed.gov/rschstat/eval/data-to-inform-instruction/report.pdf

National Forum on Education Statistics. (2024). *Forum guide to data literacy (NFES 2024-079).* U.S. Department of Education. National Center for Education Statistics. https://journals.sagepub.com/doi/abs/10.1177/1741143214537229

OECD. (2018). *Equity in education: Breaking down barriers to social mobility.* Author. https://www.oecd.org/en/publications/equity-in-education_9789264073234-en.html.

Schildkamp, K. (2019). Data-based decision-making for school improvement: Research insights and gaps. *Educational Researcher*, *61*, 257–273.

Schildkamp, K., & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*(3), 482–496.

Schildkamp, K., Lai, M., & Earl, L. (Eds.). (2013). *Data-based decision making in education*. Springer Netherlands.

Schildkamp, K., Poortman, C., Luyten, H., & Ebbeler, J. (2017). Factors promoting and hindering data-based decision making in schools. *School Effectiveness and School Improvement, 28*(2), 242–258. https://doi.org/10.1080/09243453.2016.1256901

Schumacher, C., & Ifenthaler, D. (Eds.). (2025). *International perspectives on educational data literacy: Frameworks, contexts, and practices.* Routledge.

Sharma, K., & Giannakos, M. (2020). Multimodal data capabilities for learning: What can multimodal data tell us about learning? *British Journal of Educational Technology, 51*(5), 1450–1484. doi:10.1111/bjet.12993

Sun, j., Przybylski, R., & Johnson, B. J. (2016). A review of research on teachers' use of student data: From the perspective of school leadership. *Educational Assessment, Evaluation and Accountability, 28,* 5–33. https://doi.org/10.1007/s11092-016-9238-9

Unterhalter, E. (2009). What is equity in education? Reflections from the capability approach. *Studies in Philosophy and Education, 28*(5), 415–424.

Visscher, A. J. (2021). On the value of data-based decision making in education: The evidence from six intervention studies. *Studies in Educational Evaluation, 69, 100899.* https://doi.org/10.1016/j.stueduc.2020.100899

Wayman, J. (2005). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. *Journal of Education for Students Placed at Risk, 10*(3), 295–308. https://doi.org/10.1207/s15327671espr1003_5

Wong, A. M. (2019). Driving forces of master teachers' research capability: Towards building a research culture in the division of Romblon, Philippines. *International Journal of Advanced Research and Publications, 3*(7), 92–97. https://bit.ly/39tzE13

Woodland, R., Leonard, A. M., & Martinez, I. D. (2024). Teachers' perceptions about the value of protocols for professional development: Results of a qualitative investigation. *Teacher Development, 28*(2), 158–177. https://doi.org/10.1080/13664530.2023.2265889

Wurster, S., Bez, S., & Merk, S. (2023). Does learning how to use data mean being motivated to use it? Effects of a data use intervention on data literacy and motivational beliefs of pre-service teachers. *Learning and Instruction, 88, 1*01806. https://doi.org/10.1016/j.learninstruc.2023.101806

Appendix: Supplementary material

Of all 37 items that were subjected to factor analysis, five items were removed due to cross or low loadings. These items were shown earlier in Figure 6.

The resulting 5-factor solution with the remaining 32 items is shown in Table A1, indicating both item loadings and Cronbach's alphas for each of the five factors. Table A2 shows moderate-to-strong positive correlations amongst all factors.

TABLE A1. **Pattern matrix showing item loadings on the 5-factor solution**

Item	Factor				
	Data outcomes (α = .91)	Data scrutiny (α = .92)	Data literacy (α = .83)	Data discussions (α = .88)	Data infrastructure (α = .81)
Overall, the data we collect and use in our school are sufficient to understand how students are achieving	.862				
Overall, the data we collect and use in our school are sufficient to understand how students are progressing over time	.821				
Overall, the data we collect and use in our school are important for raising student achievement	.815				
Overall, the data we collect and use in our school are sufficient to make decisions about improving our teaching	.795				
Overall, the data we collect and use in our school are important for addressing students' learning and wellbeing needs	.723				
Overall, the data we collect and use in our school are important for understanding what equitable outcomes look like for our school	.661				
Overall, the data we collect and use in our school are clearly aligned with our school's strategic goals, plans, or charter	.392				
This year, I have used quantitative data to inform my teaching of individual students or groups		.893			
This year, I have used quantitative data to identify solutions or next steps for my students		.826			
This year, I have used quantitative data to group students for teaching and learning		.817			
This year, I have used quantitative data to discuss who or which group needs support		.798			
This year, I have used quantitative data to make judgements on how effective my practice has been		.729			
This year, I have used quantitative data to identify student strengths and needs		.708			
This year, I have used quantitative data to discuss who or which group is doing well		.682			

Item	Factor				
	Data outcomes (α = .91)	Data scrutiny (α = .92)	Data literacy (α = .83)	Data discussions (α = .88)	Data infrastructure (α = .81)
Overall, I know how to compare the outcomes of different groups of students (e.g., by gender or ethnicity)			.778		
Overall, I have a good understanding of statistical terms like means, standard deviation, and range			.731		
Overall, I have sufficient data literacy to analyse, scrutinise, and ask questions about data			.721		
Overall, I am good at reflecting on my own biases and how these might influence how I analyse and interpret my data			.643		
Overall, I feel confident understanding what the data say about student achievement			.365		
Overall, we have team discussions about my data that have improved my practice				.790	
Overall, we have useful team discussions about data analysis and interpretation				.735	
Overall, our school has protocols or checklists (e.g., discussion questions) for having productive conversations about our data				.693	
Overall, within staff or team meetings, we discuss inequities shown in student data				.653	
Overall, within staff or team meetings, we have dedicated time slots to discuss data				.647	
Overall, I regularly discuss data with others in our school				.634	
Overall, I regularly share data with students and whānau for discussion				.421	
Our school uses a data system that allows viewing student data longitudinally (i.e., over time)					.709
Our school uses a data system or software that enables seeing class-level data overall and broken down by groups (e.g., by ethnicity or gender)					.696
Our school uses a data system or software that is easy to use					.645
We have a person on-site to help us with issues to do with our data systems					.510
I received useful PLD on how to access our data systems					.473
Overall, I have access to expert support (e.g., a data expert, colleague, or mentor) to understand my data when needed					.375

Note: EFA analysis was conducted using Principal Axis Factoring extraction method, with Direct Oblimin rotation converging in seven iterations.

TABLE A2. **Descriptive statistics and correlations between the five key factors**

	Range	M (SD)	α	1.	2.	3.	4.	5.
1. Data infrastructure	1–5	3.79 (.64)	.81	1				
2. Data literacy	1–5	3.99 (.53)	.83	.40**	1			
3. Data scrutiny	1–5	4.17 (.48)	.92	.31**	.46**	1		
4. Data discussions	1–5	3.53 (.66)	.88	.55**	.40**	.41**	1	
5. Data outcomes	1–5	3.97 (.51)	.91	.56**	.40**	.50**	.62**	1

Note: **p < .001. Skewness and kurtosis were inspected, and we found no violations to normality assumptions.

NZCER
Rangahau Mātauranga o Aotearoa

Rangahau Mātauranga o Aotearoa | New Zealand Council for Educational Research

www.nzcer.org.nz
facebook.com/nzcer
@NZCER
www.linkedin.com/company/new-zealand-council-for-educational-research