Digital data techniques and technologies : Reshaping the roles and responsibilities of school leaders

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A thesis submitted in total fulfilment of the requirements of the degree of

Doctor of Philosophy

Institute for Learning Sciences and Teacher Education

Faculty of Education and Arts

Australian Catholic University

2025

Abstract

The intense desire for quantified knowledge under a datafied regime has produced an array of technologies that serve to simplify the complexities of social existence into simple, comparable forms. Such technologies and their associated logics have come to dominate schooling practices in recent times (Hardy & Lewis, 2017) and subsequently affect systems of education, at both the level of policy (e.g., state education departments) and the level of practice (e.g., the individual school and leaders). Discourses of school performance are primarily linked with quantified ways of knowing (Sahlgren, 2023), effectively describing how 'what counts' is that which *can be counted* in Australian schooling systems (Lingard et al., 2016; Mockler & Stacey, 2021). A key aspect of this agenda revolves around digital data platforms; technical instruments tasked with producing datafied knowledge about schools on the premise that they offer a more neutral, objective and comparable view of how things are (Hartong, 2019).

This thesis examines how digital data platforms shape how educational leadership can be, and is, enacted within schools. I draw on a theoretical framework of digital policy sociology to examine two empirical cases, *Panorama* and *Scout*, which are digital data platforms that operate in the Victorian and New South Wales public schooling contexts respectively. Each of these platforms operate as part of broader *platformed infrastructures* which include the various policies and practices that become mobilised by each platform and their associated logics. Deploying Comparative Case Study (CCS) (Bartlett & Vavrus, 2017) as methodology, I draw on a range of data, including core information pertaining to the platforms themselves, in addition to policy documents, artefacts and interviews with school principals, to demonstrate the complexity of these arrangements. I employ Jackson and Mazzei's (2012) 'thinking with theory' approach to emphasise the need to problematise the policy problems being generated in and by the platformed infrastructures. Specifically, I emphasise the productive nature of the platformed infrastructures in terms of how they produce *foundational*, *temporal* and *relational* conditions in which educational leaders enact their work.

This thesis aims to contribute to the field of critical research through building on the existing literature on datafication in education and its implications. It is not my intention to ascertain the effectiveness of digital data techniques and technologies in spaces of educational leadership. Rather, I seek to problematise the way leaders can (and do) think about their schools in terms of the platformed performance metrics that are embedded into education systems more broadly through policy. This thesis implores the need for continuing critical interrogation into school performance mechanisms that position school leaders and their work in very specific ways.

Keywords: datafication, leadership, platformed infrastructures, comparative case study, Panorama, Scout.

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List of Abbreviations

ACARA – Australian Curriculum and Assessment Authority

ACNC – Australian Charities and Not-for-profits Commission

AI – Artificial intelligence

AIP – Annual Implementation Plan

AITSL – Australian Institute for Teaching and School Leadership

API – Application programming interface

CAF – Council for the Australian Federation

CASES21 – Computerised Administrative System Environment for Schools

CCS – Comparative Case Study

DET – Department of Education and Training (Victorian State Education Department)

DoE – Department of Education (New South Wales State Education Department)

DSPM – Differentiated Schools Performance Method

EAL/D – English as an Additional Language or Dialect

EIL – Education Improvement Leader

ESA – Education Services Australia

FISO – Framework for Improving Student Outcomes

FOEI – Family Occupation and Education Index

GUI – Graphical User Interface

KPM – Key Performance Measures

LMS – Learning Management System

MCEETYA – Ministerial Council on Education, Employment, Training and Youth Affairs

NAPLAN – National Assessment Program - Literacy and Numeracy

NCCD – Nationally Consistent Collection of Data in School Students with Disability

NSIP – National Schools Interoperability Program

NSW – New South Wales

OECD – Organisation for Economic Co-operation and Development

PAL – Policy and Advisory Library

PIRLS – Progress in International Reading Literacy Study

PISA – Program for International Student Assessment

PPC – Prior Period Comparison

PRSE – Pre-review self-evaluation

SEF – School Excellence Framework

SEIL – Senior Education Improvement Leader

SIE – Staying in Education

SIP – Strategic Improvement Plan

SPaRO – School Planning and Reporting Online

SPOT – Strategic Planning Online Tool

SSP – School Strategic Plan

TIMSS – Trends in International Mathematics and Science Study

TTFM – *Tell Them From Me* Survey

UNCRC – The United Nations Convention on the Rights of the Child

UNESCO – United Nations Educational, Scientific and Cultural Organisation

VIC – Victoria

VRQA – Victorian Registration and Qualifications Authority

Statement of Original Authorship

This thesis contains no material that has been extracted in whole or in part from a thesis that I have submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgement in the main text of the thesis.

All research procedures reported in the thesis received approval of the relevant Ethics Committees (where required).

Signed:

Date: June 5th, 2025

Publications Produced During Candidature

Journal Articles:

Rowe, E., **Langman, S.**, Mockler, N., & Lubienski, C. (2025). Perverse impacts of competitive funding: Public school principals as revenue generators in the grant economy. *Journal of Education Policy, 40*(3), 419-438. https://doi.org/10.1080/02680939.2024.2445842

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Lewis, S., & **Langman, S.** (2023, 26 – 30 November). Apple Education and the assemblage of philanthropic educational governance. *Australian Association for Research in Education Conference*, Melbourne, Victoria.

Langman, S. (2022, 27 November – 1 December). Deferred expertise: The groundless ground of datafication and the shift to recessive technologies. *Australian Association for Research in Education Conference*, Adelaide, South Australia.

Holloway, J., Lewis, S., & **Langman, S.** (2022, 27 November – 1 December). Confronting the datafication of schooling via technical democracy: Problematising the agonistic and pluralistic im/possibilities of 'hybrid forums'. *Australian Association for Research in Education Conference*, Adelaide, South Australia.

Langman, S. (2021, 28 November – 2 December). The Panorama panopticon: Reshaping educational leadership through digital data discourses. *Australian Association for Research in Education Conference*, online.

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Acknowledgements

Like the onto-epistemic foundations underpinning my research, this thesis is a product of many people who have contributed in many different ways. There simply is not enough space to name everyone individually who has inspired and encouraged me along the way, but please know that I am so appreciative of you all.

I firstly wish to acknowledge the people of the Eastern Maar nations as the traditional custodians of country on which much of this thesis was written. I am truly blessed to live along this stunningly rugged coastline and am continually inspired by the beauty of the land and sea around me. I pay my respects to the Eastern Maar people as the first educators and storytellers on this land; land that always was, and always will be, theirs.

To my supervisors, Jess Holloway, Steven Lewis and Kylie Kerr; you all know that I am my own harshest critic, so to be surrounded by such a thoughtful and supportive supervisory team has been the enabling factor in getting this thesis completed. Jess, I will be forever grateful to Julie Rowlands for introducing me to her, and I quote, 'lovely, warm and generous' colleague all of those years ago. You are the epitome of leading with kindness and thank you will never be adequate enough to express the sincere gratitude I feel for you. You believed in me long before I even contemplated believing in myself and have always accepted me just as I am. Thank you for being such an inspiration; it is both a joy and a privilege to call you my friend. Steven, I will always feel like luck was definitely on my side in securing you as a colleague and as a friend. Thank you for your encouraging words and your generosity in helping me to become the academic that I aspire to be. Our conversations of critical research tempered with Simpsons anecdotes are undoubtedly my favourite part of each workday. Kylie, you radiate warmth, passion and generosity in all that you do. Thank you for all of your support both in research and in teaching and I will endeavour to pay it forward in your honour when the opportunity arises.

To my esteemed panellists, Bob Lingard and Nelli Piattoeva. Your contributions at each of my milestones challenged me and my thinking in such a productive way. Thank you for your feedback and suggestions, as well as your positivity and enthusiasm for my research.

To the most incredible friendships made along the way which have been one of the best things to come out of this journey; thank you to my 'Ph.D. sisters' Rebecca Spratt and Tanjin Ashraf for allowing me to walk in your footsteps and for your unwavering support along the way. It has been an honour and privilege to watch you succeed, and I will forever champion you both. A special thank you to Blake Cutler, for being unequivocally you. You are light and warmth and joy, and I will continue to sing your praises to the world.

To my magnificent ACU colleagues at the Ballarat campus, thank you for your steadfast support and encouragement in these tough final stages. It is a pleasure to know and work with you, Deb DeBuhr, Linda Parish, Kylie Vanderkley, Tina Daniel, Mellita Jones and Kate Fagan. And Jonathon Sargeant, yes, the thesis is *finally* finished!

To Mum and Tim, thank you for taking care of the kids on those busy writing days and for the Mario Kart battles to 'relax and unwind' after a long day.

To my late Gran, thank you for sending the magpies along with their warbling songs when I needed them the most.

To my darling best friend, Chelsea, thank you for being my biggest cheerleader. I appreciate you for reading everything I have ever written, for fuelling me with sweet treats and 'thinking juice', for making gorgeous little babies for me to snuggle and for always being proud of me, no matter what.

To my husband, Jeremey, my greatest supporter; I am so thankful to you for constantly reminding me of my worth, particularly when I am not able to see it for myself. I could not do any of this without the reassurance that you have 'got me'. I love you eight days a week.

To my beautiful children, Teddy and Flossy, who have grown up alongside this thesis. Thank you for making each day perfect with your snuggles, your giggles and your unconditional love. I hope that you are proud of me and that you always follow your dreams, no matter how far away they might seem. I dedicate this thesis to you both.

Figure x.1: *Flume Dreaming* (2020) painted by Caroline Healy.

A close-up of my most treasured piece of art, my children immortalised in a painting of our resident coastline by the incredibly talented local artist, Caroline Healy.

Comparison is the thief of joy

Theodore Roosevelt

Prologue

There have been several small, yet interconnected, encounters throughout my teaching and leadership career in primary schools that have acted as an impetus for this research, long before I even contemplated doing doctoral research. In fact, I never imagined that I would have the opportunity to undertake a Ph.D., let alone one so heavily focused on data usage, but alas here we are. Interestingly, I recall two significant moments, both occurring during the school review process, albeit at different stages of my career. Victorian government schools are mandated to undertake a review of practice every four years to inform subsequent strategic plans for the following period of school development, as you will read about further on in this thesis (specifically in Chapter 5). Part of this process involves sitting down and critically interrogating data relative to current strategic planning documentation and goals. Both of the following noteworthy moments were entangled in the same process of undertaking a school review and really prompted me to think about data: not just *how* they were being used to understand our school's performance, but also *what* data were being used and *for what purpose(s)*.

The primary instance was my first experience being on the review panel for my school. While this was well over a decade ago, this moment still burns so strong in my mind for the unfairness I felt as an educator and for the way in which my students were portrayed. I was sitting at the conference table in my school with the review panel, which comprised other staff members from within our school including the principal, two 'challenge partners' (who were principals from other schools within our local network), our Department of Education network leader and the independent reviewer who was chairing the process. Being a small school, we felt that we knew our students well. We were also aware that while we had made improvements throughout the school in our time there so far, that there was indeed still much work to be done to actualise our visions for the school community more broadly. We were also still healing from a highly traumatic school bus accident that had severely injured several of our students three years prior.[1]

As we went through the task of reviewing our previous strategic plan and reflecting on whether, and how well, we had met the goals and targets within that document, the reflective conversation turned towards our annual standardised testing results (perhaps quite unsurprisingly

[1] I have a chapter entitled 'Small schools as community pillars of strength' in Barnes, Riddle, Hughes, Beabout & Hughes (Eds.) in the forthcoming *International Handbook of Schooling in Times of Crisis*. In this chapter, I recount my raw experiences of this school bus accident and offer suggestions for schools and systems more broadly to consider when facing similar experiences of crisis, particularly in small, rural school settings.

to those familiar with the Australian schooling context). In particular, we were looking at our most recent Year 5 NAPLAN data,[2] and specifically the fact that we had not met our set targets of 90% of all students achieving the standard or above across the different learning domains. Instead, it was being discussed how far short we had fallen of our targets, given that only 75% of our students were achieving that standard or above, and this must be a continued focus in our forthcoming strategic plan. Being the classroom teacher of that cohort of students, I felt a real disjuncture here in this moment; quantifiably, the metrics were expressing that one quarter of my students were working below the expected level – impossible! Not according to my teacher 'data' (which I took to be inclusive of a broader range of observations, anecdotal records, curriculum-based assessment tasks, and so on). A couple of my students were certainly below their 'expected level' but they were still making excellent growth, relative to their ability. These various forms of data were just not aligning for me.

So, I raised this point with the panel, and upon looking into it further, realised that we were discussing a cohort of just *four students* within this Year 5 data, with each student representing a significant 25% of the overall results. But instead of being able to explain this, we then had to find new ways to use these data 'more effectively'. Aggregation was suggested as an obvious solution; instead of focusing on one cohort, we would use a three-year rolling aggregate to get a more 'accurate' indication. This amounted to just sixteen students in total; still a statistically small sample, and still with potential for skews, given that we also catered to quite a diverse community of learners. We then looked ahead at our students coming through the school, to try to predict what might be a fair target, given their current performance in their early primary years. Again, this was problematic, as we had a high proportion of transience throughout the community due to the unpredictable nature of farming work. With all signs glaringly pointing to the obvious – that NAPLAN data were going to always be problematic and potentially not the best target indicators of performance to use here in such a small school setting – you might be surprised (or not) to learn that we were still encouraged by the panel to aim towards 'improving' these figures in the new strategic plan. There was some negotiation (also read as begging – 'please let us set a goal that we might actually achieve, and not a 90% improbability like last time'), but ultimately, we still set targets based around the very data that were problematic for our particular setting.

[2] NAPLAN is an acronym for the National Assessment Program – Literacy and Numeracy. This is an annual standardised assessment regime where all Australian students in Years 3, 5, 7 and 9 sit four specific tests (Reading, Writing, Conventions of Language and Numeracy). These tests record student progress over time and are used more systematically to monitor and evaluate the performance of schools and school systems within Australia.

I was a more experienced teacher, and school leader, the next time I was involved in this review process. I had already begun my Master of Education postgraduate degree and associated research for my minor thesis, so I was perhaps present in a more critical mindset. Essentially, we had the same scenario happen once again. As we were reflecting on our progress against the previous strategic plan, we again came across this moment where we had not met *any* of the targets we had set in the previous plan for our NAPLAN data. I felt like I was in a better position to argue my point this time, and clearly articulated the problematic nature of these targets, and discussed other measures that we might adopt instead for generating targets in our next plan. The challenge partners were both in agreement and sympathetic, as was our network leader, and it seemed like there was a shared understanding that we needed to be able to do things differently from the norm based around our specific context.

Sadly, though, as we returned to write the targets for the next plan, it was clearly stated that we would still need to *do something* about our NAPLAN data, as if it was this horrific blot on our permanent record, despite a shared understanding that it was problematic. Not only were our results 'below', in terms of our own school-based targets, but so too were they also 'below' in a comparative sense relative to 'similar schools', as well as the national average as produced in our school performance report (generated by the Department's central data platform, *Panorama*, a core focus of this thesis). Similarly, the visual representations on Panorama put our school's NAPLAN performance as less than ideal, with a higher percentage of the student population falling below the minimum standard benchmark line and into the 'black', the colour category of underperformance. A deep realisation set in this moment, an understanding that the data were so deeply entangled with policy that our very leadership practices had become entrenched within data and their associated practices. This thesis aims to examine this very notion; to understand how data and their framing platforms, coupled with associated policy, shape how educational leadership can and is enacted in schools, particularly in relation to understanding school performance.

I share this short prologue at the outset to foreground my entanglement with the research within. I cannot claim to have stood from some objective standpoint and examined the research that comprises this thesis; my extensive prior experiences working in education as both a teacher and as a leader could not allow such detachment. In research, this is often seen in as a downfall rather than a virtue for a myriad of reasons, from producing what could be considered as 'self-indulgent' accounts focused more on the researcher than the research itself to the production of ethically questionable methods (Bright et al., 2024). However, I accept and embrace this entanglement at the outset, emphasising that this research is what it is *because* of my lived

experiences as a teacher and leader and that these experiences have shaped my researcher identity. Does this disrupt the 'validity' of my research findings? Possibly. But, as my principal supervisor is fond of stating, research does not exist in a vacuum; that is, it cannot be fully understood in isolation and devoid of context. So, while I acknowledge the challenges that come from being so entangled in the research topic, and reject the insider-outsider researcher binary, I also embrace that this research is only possible because of this entanglement; that should it ever be replicated, that differences can (and should) prevail.

I do not position my reflexivity as researcher as an excuse of any kind or as a 'get out of jail free card' for *ad hoc*-ery. In fact, I openly acknowledge the difficulty at times of challenging my own pre-conceived notions and critically considering the work in front of me. But, like Deleuze and Guattari foreground in the opening lines of *A Thousand Plateaus* (2013), a text that continues to both inspire and baffle me, I am multiple, and as such I can hold a number of perspectives that can be contradictory to one another yet simultaneously be true at the same time. In many ways, this thesis, like the premise of *A Thousand Plateaus*, has been an exercise in thinking differently and of rendering the familiar strange, and thus engaging in critical thinking. For me, reflexivity has become more than just a 'methodological obligation to an existential commitment' (Bright et al., 2024, p. 11): it is one that has been present throughout my doctoral journey and hence this thesis.

I am comfortable admitting that I began this doctoral journey in much more of a binary mindset, my mind focused on identifying what was notionally 'good' about data use in educational leadership and what were the 'pitfalls' (and the 'so what' of this thinking). But I found this left me feeling conflicted and dissatisfied, particularly with the recognition that I had myself engaged in the very practices that I was now critiquing. Did that also mean that I was an ineffective leader if I enacted the very practices I was now critiquing? I like to think not. So, my attention instead turned more to examining the conditions around data practices in educational leadership and considering what was made possible as a result of the data infrastructures[3] in place. In this way, my reflexivity was 'not a matter of looking harder or more closely, but of *seeing* what frames our seeing' (Lather, 1993, p. 675; emphasis added), and of specifically considering the ways in which data discourses were influencing the very practise of education leadership and governance.

[3] The term *data infrastructures* refers to the material mechanisms that produce data (in this context, about schools), including everything from the algorithms embedded in the data platforms, to the accompanying policies, in addition to the types of sensibilities that afford themselves to this form of digital governance. It is further detailed in Chapter 2.

Following Massumi (2010), Sellar and colleagues (2014) discuss the notion of such an immanent critique, as one that is:

> …predicated on asking what a thing or situation can do, what it affords and how one might work with these affordances, rather than aiming to determine whether the thing or situation is good or bad or any of the myriad terms that are used to stand in for such valuation. (Sellar et al., 2014, p. 464)

Such thinking has formed the basis for this thesis, which is why articulating it at the outset is important. I wish for you to hold this strongly in mind as you engage with this thesis, and I issue you a similar challenge: while reading, consider your own encounters with the content in this thesis and, in turn, how this frames your own *seeing* of the presented thinking.

Chapter 1: Introduction

Figure 1.1: *A Parrot for Juan Gris* (1953-54) by Joseph Cornell**.**

From *National Gallery of Art*, retrieved from https://www.nga.gov/artworks/228035-parrot-juan-gris. 2025 National Gallery of Art.

Cornell was an early pioneer of assemblage as an artistic genre. This piece invites viewers to consider the relationship between the different elements in the box, while also paying homage to cubist painter, Juan Gris, by whom Cornell was deeply influenced.

1.1 Beginning in the middle

In many ways, I feel like I commenced this thesis 'in the middle'; I jumped into my doctoral studies with somewhat of a plan but also with the idea that I wanted the research to take me where it needed. Having just completed my Master's, I felt that I was still in the middle of that research in many ways and now sought to use those learnings to inform the beginning stages of my Ph.D. On a personal level, I was also in-between many other mid-life aspects, including raising young children, navigating career changes, and understanding my sense of self in the face of constant change. As mentioned in the Prologue, I have also grappled with my validity as a researcher in terms of my lived experiences and how these influence my outlook on the world. My thinking of

what constitutes scientific research has been challenged immensely; being in the driver's seat is much more complex than critiquing from the outside. However, rather than seeking to 'begin at the beginning', as Lewis Carroll suggested in the beloved children's text *Alice in Wonderland* and feeling the overwhelming responsibility of not knowing where or even how to start this thesis, I wish to make a virtue of this middle-ness. I have been swimming around in words and books and papers for the last three-and-a-half years, slowly gathering my thoughts and assuming that they would build to a glorious crescendo of knowledge (if it were only that simple).

As I was considering how to bring this thesis together into a coherent narrative, I looked around my home office, which has over the years become a makeshift gallery for my children's artworks. It is a monument to them and their artistic development, but also a source of constant joy for me; the simplicity of their drawings reflecting the subjects that matter most to them at a particular day and time. They are also an antithesis of an education increasingly thought of in universal and standardised (and standardisable) ways for the purposes of understanding their learning and performance more 'clearly' and more 'objectively' (discussed further in the following section, section 1.2). From my son's earlier drawings of simple potato-esque people,[4] to his incredibly detailed comic strips full of odd superheroes and witty commentary; my daughter's very early colouring attempts where she *almost* managed to stay in the lines, to her now often rainbow-themed drawings that include special little messages, such as 'to mummy, love Flozzy' (we are still experiencing reversals of the letter 'S'). These, to me, are genuine examples of learning performance that cannot (or should not) be translated into a quantifiable measure.

And so, in looking for a thread to flow through and connect the chapters of this thesis, I found myself reminiscing about the many times art helped me to make sense of this thesis and the world more generally. My subconscious appreciation for art obviously followed me throughout my philosophical reading, where I noticed scholars using art-related ideas to illustrate their specific concepts. I recall, for example, how art analogies assisted me to build my understanding of the highly complex notion of assemblage in my early encounters with Deleuze and Guattari. Claire Colebrook, an avid explorer of Deleuze and Guattari's philosophical work, helpfully explained the 'proliferation of machinic connections' (Colebrook, 2002a, p. 56) that underpin assemblage thinking through the example of a bicycle. The machinic production of a bicycle is entirely dependent on its connections to other 'machines'; when it connects with a body of a

[4] Early childhood educators and primary-level teachers will best understand this term. For others, it refers to the typical early drawings of people by children that are best described as a potato with stick arms and legs and generally include a smiley face in the centre.

cyclist, it becomes a means of transportation, but when it is placed upon a plinth in a gallery, it becomes an artistic object. I also had an influential conversation at my final milestone review with a panellist about the content of my written submission and its relationship to Foucault's *This is not a Pipe* (2008), a text inspired by the artistry of René Magritte. In this book, Foucault uses Magritte's painting of the same name to explore the construction of reality through systems of meaning (thank you, Bob, for making this connection). Undoubtedly, as with the impetus for this research as discussed at the outset in the Prologue, it was likely an amalgamation of numerous unsuspecting events and encounters that led to my use of art as a form of articulation, or *art/iculation*, perhaps.

At the outset of this chapter (and those that follow), I present an artwork that acts as an anchor point; something relational to serve as a point of encounter to 'think with' (Jackson & Mazzei, 2012) the contents of the chapter. The selected artworks offer a proposition for considering what follows while also leaving space for the reader to encourage their own extrapolations. While I provide some of my own musings, much like *A Parrot for Juan Gris,* I invite the reader to ponder on the relationship between artwork and written word. I invite readers to engage with my thinking as a 'written approximation' (Kamler & Thomson, 2014, p. 11), rather than accepting it as a single source of truth. I agree with Kamler and Thomson (2014) that writing is a discursive practice, in which my researcher entanglement is a necessary part. For this thesis to be 'productive' in a knowledge sense, there needs to be genuine engagement that comes from an ability to critically question the content provided as described in the Prologue. My hope is that this thesis will *stimulate* thinking around the broader area of leadership and governance in a schooling regime that valorises quantification and standardisation through and as and by data, rather than hoping to provide neat and tidy answers around a predetermined research problem. In this way, the thesis remains a productive entity long after submission, which also helps me to accept a certain level of finality (for now) that I will discuss further in the concluding Chapter 8.

So, I commence in the middle with Cornell's *A Parrot for Juan Gris* to emphasise the distinctive style of artistry and its influence on this thesis as a whole. This thesis, and the research therein, contains many parts arranged to tell a non-linear story of my doctoral studies. In many ways, it is an amalgamation of different lines of thinking that all seek to produce the thesis in its current state. Much like the 'educated magpie', as described by O'Toole and Beckett (2013, p. 111), I have spent years now looking for the 'glittering pieces of silver' to include in this thesis and tinkering with how best to 'thread them into her [my] nest'. While I will endeavour to provide a replicable account of how I 'did' the research, I acknowledge the important role of the researcher as being deeply ensnared in the research project. Even with the same method and same materials,

another scholar could (and likely would) assemble a very different final product. As with assemblage as an artistic style that privileges the arrangement of everyday objects as artistic compositions over more 'conventional' materials (like paint, clay, marble, etc.), the content that I have included within this thesis and the way in which I have arranged that content reflects my own researcher entanglement. But first and foremost, like *A Parrot for Juan Gris*, this thesis is a homage to a field that continues to inspire me, from philosophical thinkers and scholars across fields of education, policy and technologies, to teachers and principals working at the coal face.[5]

1.2 Purpose of the study[6]

Data. It has without doubt become a highly loaded term across a range of settings, not least of which is education. 'Data-informed', 'data-based', 'drawing on data' are all common phrases within education discourse (Bradbury & Roberts-Holmes, 2018; Hardy & Lewis, 2017). While there is still contestation about what constitute data in terms of the tensions between quantitative and qualitative forms (see Prøitz et al., 2017), there is an increasing tendency today to focus on data as pieces of information represented in a quantified format. Such a logic of representation is referred to as *datafication*, which sees all aspects of social life as able to be rendered down to simplified, measurable representations (Bradbury & Roberts-Holmes, 2018), on the premise they offer a more neutral, objective and comparable view of how things are (Hartong, 2019). The allure of numerical data derives from their 'aura of disinterestedness, impersonality, objectivity and universality that lends *legitimacy*' (Piattoeva & Boden, 2020, p. 6; emphasis added). Numerical data come with a promise to aid in sense-making tasks in our world (Hardy, 2021), allowing us to know in ways that are simpler and more effective than human sensibilities could ever allow. However, the mobilisation of data also requires technical infrastructures, or 'complex assemblages of technology, people and policies' (Sellar, 2015, p. 766), to facilitate their enactment. In education, this includes technical components (i.e., platforms, algorithms, software) along with key personnel (i.e., teachers, principals, administrators) and the associated sensibilities required to enact datafied policy regimes. Within this urge to know the world *through* and *by* data, this thesis seeks to examine the generative nature of data platforms as technologies that produce (as well as are produced by) key foundations for how school leadership can be enacted in educational settings.

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[5] And Jess, the parrot is especially for you.

[6] Much of this section has been previously published in the paper, Langman, S. (2024). Deferred expertise: The groundless ground of datafication and the shift to recessive technologies. *Educational Philosophy and Theory*. https://doi.org/10.1080/00131857.2024.2411336

While processes of data collection have a long-standing place in education (Thompson & Sellar, 2018), current methods of schooling are now established around a productive engagement with *digital* forms of data (Selwyn et al., 2021). This has caused shifts in how we both conceptualise and enact 'learning' in schools (Knox et al., 2020), which alters not only the process of schooling itself (e.g., in terms of pedagogy, assessment and leadership) but also reshapes how schools become known. Methods and logics of data involving the quantification of information have now come to dominate schooling practices (Hardy & Lewis, 2017) and subsequently affect policy in systems of education, at the level of policy (e.g., state education departments) and the level of practice (e.g., the individual school and classroom). Of particular importance are regimes of accountability, where discourses of school improvement permeate policy and practice and are primarily linked with quantified ways of knowing (Sahlgren, 2023). This effectively describes how 'what counts' is that which can be counted in Australian schooling systems (Lingard et al., 2016; Mockler & Stacey, 2021).

Functioning under the guise of representing an objective reality, data also aid in the movement of information within and across wider education systems (Lewis & Hartong, 2022; Williamson & Piattoeva, 2019). This movement requires technologies and techniques (and frequently specialised personnel) to be deployed alongside policies and practices as part of complete digital data infrastructures. Such infrastructures require a multifaceted approach to understand the entangled arrangements of the more *tangible* aspects of the infrastructure (i.e., platforms, dashboards, policy documents, etc.) and the more *intangible* elements (i.e., subjectivities, social practices, habits of thought) (Gulson & Sellar, 2019). Many aspects of datafication and their associated technologies have been explored in recent research, including data infrastructures (see Clutterbuck et al., 2023; Hartong & Förschler, 2019; Lingard, 2019; Sellar & Gulson, 2021), critical data platform studies (see Decuypere et al., 2021; Pangrazio et al., 2023; Perrotta et al., 2021) and the platformisation of education more generally (see Kerssens & van Dijck, 2022; Lewis, 2022). That said, there has arguably been far less in the way of explicit studies that attend to the reshaping of professional identities through digital platforms and their broader data infrastructures (Hartong & Decuypere, 2023). Much of the scholarship in this area has so far focused largely on the re-professionalisation of *teachers* (see, for example, Holloway, 2021; Manolev et al., 2019); however, this thesis aims to specifically build on the work of scholars interested in exploring the datafied conditions around *educational leaders and leadership* (see, for example, Heffernan, 2018).

This thesis offers a critical analysis of datafication in spaces of educational leadership. This does not mean that I seek to produce an exposé attributing the pitfalls of our current education

system to issues of mere metric preoccupations. As I addressed in the Prologue, this caused me significant discomfort as a line of inquiry. First, nothing is ever that simple, particularly in a complex social field like education. Second, nothing, including measurement, is simply bad in and of itself. Metricised data practices have indeed enabled notionally 'good' things to occur for education and have instigated important equity conversations, such as identifying systemic disparities that impact student access to learning (see, for example, Darling-Hammond, 2010). What is problematic is when metrics are used excessively and in potentially detrimental ways. Now, of course, what is considered 'detrimental' is also highly subjective; in the context of the professional expertise, we could consider a detrimental application of metrics as being one where they are used to 'game' the system (see, for example, Lingard & Sellar, 2013), or else one that creates internal conflict between the leader's own sensibilities (as discussed further in Chapter 7). It thus becomes pertinent to think critically about *what* is being said about schools by those in positions of leadership and, importantly, *how* it is being said in an increasingly datafied context.

1.3 Guiding questions

To facilitate the research, three key overarching research questions were developed to drive the overall inquiry:

1) How are datafication logics (re)shaping the technologies, techniques and subjectivities of educational leadership?
2) How are digital data techniques and technologies (re)shaping leadership temporalities?
3) How are digital data techniques and technologies (re)shaping how leaders know and lead their schools?

While each question has its own distinct focus, there is also a need to consider the three questions simultaneously. When taken together, these questions are about investigating the conditions in which educational leaders enact their work; conditions that produce (and are produced by) data platforms and their associated policies and practices. It is through this very line of enquiry whereby we can get ourselves to a point of potential transformation, given that 'as soon as one can no longer think things as one formerly thought them, transformation becomes both very urgent, very difficult and quite possible' (Foucault, 1990, p. 155). That is, to trouble the discourses around school performance in the datafied context becomes necessary to reimagine any future iterations of education systems. We must first render strange our current ways of thinking by understanding how these have come to be so that we might again think them anew.

1.4 Overview of the thesis

To introduce this thesis, Chapter 1 has provided an overall introduction and has oriented readers to the overarching research aim and associated questions. It contextualised the research in relation to the current datafied state of education and how this is impacting the way that educational leadership can be, and is being, enacted in the Australian context (and more specifically, in the Departments of Education in the State Governments of Victoria and New South Wales).

Next, Chapter 2 presents a critical engagement with relevant literature that has been used to frame this study. It maps out the current field of educational leadership and policy research in Australia, with some international points of comparison. Literature pertaining to platform studies and data infrastructures are critically examined, with a particular view to the role of platforms and data for digital educational governance, which is followed by a commentary on how agency and autonomy are afforded to those in positions of educational leadership. This chapter concludes with a discussion of the importance for further critical research to be conducted within these areas and offers insight into the future direction of this specific project.

Chapter 3 details the theoretical framework developed for this study. I begin by outlining the overarching role of the poststructuralist paradigm and how I have adopted this for the context of this research. I then connect this thinking to digital policy sociology, which is the specific theoretical framework for this study. I outline the emergence of digital policy sociology as a necessary evolution of critical policy studies to recognise the important role digital technologies play in our lives and, more specifically, within education and educational leadership. Following this, I detail the various concepts that have been brought together to 'think with' (Jackson & Mazzei, 2012) the empirical materials of this project.

In Chapter 4, I provide an overview of the research design, methodology and methods used to conduct this project. I explain the use of Comparative Case Study (CCS) (Bartlett & Vavrus, 2017) as methodology to explore two central cases in detail: *Panorama* in Victoria; and *Scout* in New South Wales. These cases are what I refer to as *platformed infrastructures*, which centre around two digital data platforms used by State Departments of Education and the policy and practices that ultimately animate them. I discuss the methods employed to collect data for each of these cases and the analytical strategies I deployed, including a discussion of the ethical considerations throughout various stages of the research design.

Chapter 5, the first of three analysis chapters, examines the generative nature of the two cases of platformed infrastructures that produce (and are produced by) key *foundations* for how leadership can be enacted in educational settings. Specifically, I conceptualise the platforms as recessive technologies that subsequently create conditions for the deferring of expertise from

school leaders over to technologies that can know in ways that are more conducive to datafied environments.

Chapter 6 similarly attends to the productions of the platformed infrastructures, but with a focus on *temporalities*. I use the data corpus, specifically policy documents and key artefacts relating to the Panorama and Scout platforms, to problematise data 'laundering' techniques that make school performance 'knowable' in the present space-time of education.

Chapter 7, the third analysis chapter, investigates the *relational* aspects of the platformed infrastructures. Specifically, I draw on interview data with school principals to discuss their interactions in relation to the platforms in their context, and how this influences their conduction of leadership in their specific settings.

Chapter 8 provides a concluding discussion to the thesis. It contains a summary of the research aims, processes and key discussion elements that offer new empirical insights and methodological considerations for the leadership and policy spaces in educational research. It also considers implications for future research.

1.5 Conclusion

I hope to have demonstrated that this thesis is deliberately (and necessarily) eclectic in nature. There are conventional aspects included (such as research questions, a defined purpose, findings, etc.) but also those that might be considered abnormal (like the art stimuli). Similarly, I have found myself 'proceeding from the middle, through the middle, coming and going rather than starting and finishing' (Deleuze & Guattari, 2013, p. 27), which has, at times, been very messy and very unsettling. The justification for such eclecticism will come later (particularly in Chapter 3); for now, it is important to acknowledge that theoretical richness and interdisciplinary diversity has been necessary to adequately address the complexity of the empirical cases being studied.

Education is a multifarious concept; as a field of research, such convolution is unbelievably challenging as human behaviours and social systems are both dynamic forces that are subject to continuous change and influence. For years, scholars have been urging that research (and researchers) must not shy away from the precariousness of education because it is an 'encounter between human beings' (Biesta, 2016, p. 1). This study has been no exception and I embrace that complex problems require equally complex research designs to adequately address this challenge (Yates, 2004). Afterall, 'the life of interpretation...is to believe that there are only interpretations' (Foucault, 2008, p. 12). This thesis demonstrates just that – infinite layers of interpretation. It is my task here to hopefully interpret those interpretations differently.

Chapter 2: Literatures

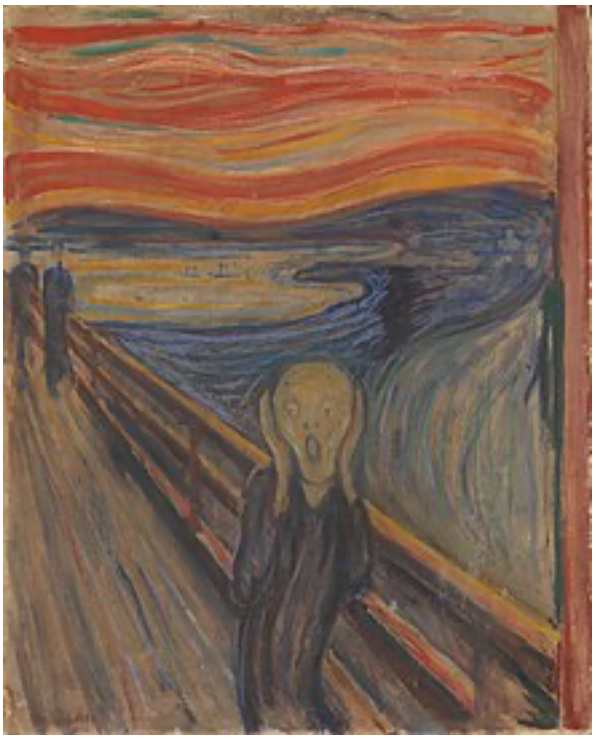

Figure 2.1: *The Scream* (1893) by Edvard Munch.

From *National Museum*, retrieved from https://www.nasjonalmuseet.no/en/collection/object/NG.M.00939. CC BY 4.0.

This composition is said to have been created by the Munch to represent the way in which we, as a society, are constantly filled with anxiety and uncertainty.

2.1 Introduction

The purpose of this chapter is to present an overview of the relevant literature that continues to inform this study. The metaphor here for this chapter's accompanying artwork, *The Scream*, is not to be understated; undertaking a literature review feels, at times, like an improbable task for several reasons. Firstly, an interdisciplinary study such as this one draws across a number of fields, multiplying the amount of literature to wade through. Secondly, scholarly literature is a constantly evolving beast; new papers are continually being produced, particularly when technology is such a rapidly evolving field and focus of study, and so trying to capture such a moving behemoth is quite challenging. And thirdly comes what has been a most significant challenge: arranging all of this thinking in a way that makes sense in relation to the broader aims of the research. Kamler and Thomson's (2014) metaphor of undertaking a literature review as being akin to persuading an octopus into a jar is quite apt here; the gentle encouraging of a complex living thing into a confined space so that one can stop and admire it is quite fitting.

Nonetheless, critically examining the available literature is a key part of outlining the specific parameters for understanding and contextualising the research problem (Creswell & Creswell, 2018). As such, this chapter contextualises the research problem by framing it against the rising prevalence of quantified data use and collection in school accountability regimes, and specifically the impacts that this has on how school leaders conduct their work. Literature pertaining to critical platform studies and data infrastructures are examined, with a particular view to the role of platforms and data for digital educational governance, which is followed by a commentary on how agency and autonomy are afforded to those in positions of educational leadership. This chapter concludes with a discussion of the importance for further critical research to be conducted within these areas, particularly in light of how technologies are impacting the work of school leaders, and offers insight into the future direction of this specific research.

2.2 Data regimes in schools and schooling systems

As mentioned in Chapter 1 (section 1.2), schools have always produced data of one form or another (Selwyn et al., 2021; Thompson & Sellar, 2018), often in the form of numerical representations. Attendance and examination results, for example, are enduring methods of quantification that are still present in our schools and broader systems even today, albeit with the difference that such methods are now collected and collated *digitally*. The introduction of digital technologies, however, has significantly shifted both the *types* of data that are now being produced, collected and used within schooling systems as well as the sheer *amount* of data that can be managed. Such developments have led to significant policy changes in how data is being used in schools and to what ends. The translation of specific aspects of schooling into numeric representations of student learning have enabled such data to become explicitly entwined with policy practices to serve largely as direct indicators of performance for teachers, leaders, schools and wider systems (Sellar, 2015a).

Datafication, or the processes and logics of translating things into numbers (Sellar, 2015b), is largely built on the premise that technology and the numbers they produce are neutral and thereby free of power and potential unfairness (Hartong, 2019). The datafication of education sees every aspect of schooling 'rendered as data to be collected, analysed, surveilled, and controlled' (Holloway, 2020, p. 4). These processes do not simply change the work that is done and how it is completed, but also serves to fundamentally change '*who people are*, or who they are expected to be' (Bradbury & Roberts-Holmes, 2017, cited in Bradbury, 2019, p. 8; emphasis original). Education as a field has been noticeably affected by datafication. The reasons for this are twofold; on the one hand are the immediate ways of reconstructing teaching and learning practices through

data, but also in regard to the preparation of learners to continue to participate in an increasingly datafied world.

At the very epicentre of datafied regimes are school professionals who are largely tasked with the collection of data for a range of purposes. School leaders are now under immense pressure to perform well in competitive environments (Ball, 2003), as their profession becomes increasingly scrutinised through such datafied representations. With principal effectiveness being progressively defined by the data produced by and about them (Thompson & Mockler, 2016), school leadership is perhaps unsurprisingly characterised by inordinate levels of stress (Keddie et al., 2020; Mahfouz, 2020), something which COVID-19 has only exacerbated. Globally, we have witnessed a turn towards national standardised assessment (Piattoeva, 2015) and Australia has not been immune to these developments. The introduction of national educational policy commitments, like the *National Assessment Program – Literacy and Numeracy* (NAPLAN),[7] significantly altered the educational landscape, with this national reform putting school performance and accountability in the public eye. Similarly, as part of the same election promise by the Labor government (discussed further in Chapter 5), the development of the *My School* website[8] created an agenda built on transparency of schooling practices through similar logics of accountability (Lingard & Sellar, 2013). This further exemplified a 'trust in numbers' (Ozga, 2016; Porter, 1995) and created the perfect storm of panicked conditions due to high-stakes and highly visible quantified agendas.

Data procured through such standardised regimes serve as a proverbial health check of school performance, and are often entwined in other practices, including systemic funding reforms (Madsen, 2025). Such reforms can prompt future policy developments, as well as future strategic directions for schools. However, such regimes can also lead to 'perverse effects' (Lingard & Sellar, 2013) including the gaming of performance targets as well as a 'teaching to the test' mentality (Hardy, 2015). Performativity (Ball, 2003) has been invoked previously as a way to understand how datafied agendas construct the social realities of schooling; that is practices associated

[7] The *National Assessment Program – Literacy and Numeracy* (NAPLAN) was introduced in 2008 as part of a national commitment to education reform in Australia. NAPLAN is an annual assessment where all students in Years 3, 5, 7 and 9 across Australia are expected to participate in tests in reading, writing, language conventions (spelling, grammar and punctuation) and numeracy. It is managed by the independent statutory authority, the Australian Curriculum, Assessment and Reporting Authority (ACARA) in collaboration with state and territory representatives.

[8] The *My School* website, managed by ACARA, was first launched in 2010 to provide public access to information about Australian schools. This website reports data from NAPLAN as well as other core information about schools, including staffing profiles, enrolment figures, financial summaries and attendance rates.

standardised testing and data tracking do not just measure a school's (or system's) performance, but serve to actively shape what constitutes performance success. Such thinking has the potential to reframe the question of what is worth counting to what can be counted (Williamson, 2017), placing principals and school leaders in a position where they are (at risk of) merely enacting processes rather than being active critical thinkers. However, statistical literacy becomes a highly pertinent issue, given that teachers and school leaders often lack the capacity (e.g., expertise, time) to decipher data in a way that allows for meaningful enactment (Chick & Pierce, 2013; Park & Datnow, 2009).

Nonetheless, improving data profiles has become a clear example of leader effectiveness, with principals being directly valorised for their performance against system-defined metrics (Heffernan, 2018). This risks damaging school leaders' self-efficacy and belief in their ability to complete their job effectively (Mahfouz, 2020). The fact that 'school principals have been experiencing increased workloads, stress, anxiety and poor health and poorer wellbeing outcomes for a number of years' (Niesche et al., 2023, p. 1261) is a worrisome trend that points to unreasonable expectations that come with school leadership roles. The logics of what it takes to be an effective leader or principal have become synonymous with availability and the glamourising of overworking, which all point to the increasing intensification of school leaders' work within datafication regimes (Heffernan & Selwyn, 2023; Thompson, Mockler, et al., 2022). The next section considers how such data regimes have been theorised in the scholarly literature, particularly through the increasing datafication of education, and the effects that this has.

2.3 The shift towards datafication

As mentioned in the previous section, there has been a noticeable rise in the use of datafication within education research to theorise and consider the rise in data usage in schools and schooling systems. Research has theorised this turn by often using a Foucauldian analysis, which occupies a well-established place in educational literature, and particularly in the field of educational leadership (see Ball, 2003; Heffernan, 2018; Niesche, 2016). However, there has been a significant rise in the use of Deleuzian thinking to both challenge and extend upon the work of Foucault, in order to more fully theorise the shift towards societies of control (Deleuze, 1992) from earlier societies of discipline.

In his seminal piece *Postscript on the Societies of Control*, Deleuze (1992) contests that societies are largely shifting away from Foucauldian disciplinary institutions, characterised by discrete, enclosed environments (e.g., the school, the factory, the prison) tasked with producing docile bodies (Foucault, 1977). Instead, Deleuze offers that disciplinary power is being replaced

by modulatory power, in which 'one is never finished with anything' (Deleuze, 1992, p. 5). Surveillance of people within disciplinary societies shifts instead to *dataveillance* in control societies, in which 'data doubles' or 'dividuals' are produced as a type of 'deferred identity' (Savat, 2013, p. 41) that enables them to be reconstructed as code (Simon, 2002). These 'dividuals' become a data *doppelgänger* of sorts and essentially become the privileged locus of surveillance, shifting the focus of the disciplinary gaze away from the embodied self to a constructed, countable, data-based identity. Webb (2011) argues that the shift from Foucauldian discipline to Deleuzian control is particularly evident in the quantified measures of accountability logics that pervade the current representation of education systems. The shift from discipline to societies of control is further exemplified through the way that children's identities are already datafied through state health and wellbeing platforms before they are even old enough to engage with technologies themselves (Bradbury, 2019; Pangrazio & Selwyn, 2021).

However, control should not be seen as somehow replacing discipline, as this offers a very limited binary understanding of such concepts (Hong, 2020; Iveson & Maalsen, 2019). Rather, modulation, a form of power that continually adapts and deforms itself, might be understood to *follow* disciplinarity (Thompson & Cook, 2012), and drawing on a combined framework of Foucauldian and Deleuzian thought can thus offer interesting insights into the datafication of schooling (see also Bradbury, 2019; Holloway & Lewis, 2022; Niesche, 2015). Critical research on the occurrence and effects of the datafication of schooling have been emerging in recent years to problematise and reveal the wider effects of these logics (Buchanan & McPherson, 2019; Holloway, 2020; Lewis & Holloway, 2019; Lupton & Williamson, 2017). Empirical research into datafication has examined how data and their associated technologies are fundamentally reshaping the subjectivities and discursive practices of school staff. Lewis and Holloway (2019) explain how data in schools are *effective*, insofar as they change 'what counts', as well as *affective* through their production of new data-responsive subjectivities, which ultimately serves to reconstitute teacher professionalism. This (re)shaping of the work of teachers is echoed by Daliri-Ngametua and colleagues (2022), who describe how teachers enact datafication practices by way of compliance, rather than out of professional necessity. The acceptance of datafied constructions as constituting evidence of learning (Thompson & Mockler, 2016) is characteristic of accountability regimes.

However, other research examining the datafication of education conversely argue that techniques of datafication are merely replicating already well-established systems and are simply making them more efficient. Selwyn and colleagues (2021), for example, reflect on an enduring form of data collection via the recording of student attendance. Their findings suggest that schools

are (re)appropriating the myriad of data at their disposal in ways that allow them to continue with their work as they have previously done. That being said, the fact that schools are responding to datafied logics at all should be evidence, arguably, of data's influence in how schools know and are knowable in datafied regimes. With educational institutions transforming into sites of data production (Williamson, 2016), while leaders, teachers and learners are being reassembled into 'data doubles' that are constructed from a limited range of measurable categories, datafied constructions can begin to supersede the actual physical person as the site of surveillance and knowing (Holloway, 2020). At the same time, technologies and processes of datafication do not simply strip education subjects of all their complexities (Clutterbuck et al., 2023); that is, they also fundamentally 'reconfigure what counts as truth and who – or what – has the right to produce it' (Hong, 2020, p. 13).

What becomes highly necessary in such datafied regimes are the development and deployment of specific digital techniques and technologies in order to make these regimes work, generally in the form of broader infrastructures. This means consideration needs to be given not just to the specific technologies (i.e., platforms, software) but also to the various 'dispositions' (Easterling, 2014) that are required to engage in the broader infrastructures associated with data. The following section begins to disentangle some of the key literature pertaining to education in this space and to also define some of the key terminology that is crucial for understanding this thesis.

2.4 Data infrastructures and their components

There has been a noticeable rise in the body of work pertaining to digital data infrastructures as we realise the complexity of data and their systems. Sellar (2015b) offers a useful definition of infrastructures as 'complex assemblages of technology, people and policies' (p. 766) that extend across the assembly of schooling domains (see also Hartong, 2018). Infrastructures as a term is not just invoked to describe the physical objects in a particular context, but one that pays equal attention to the social phenomena associated with establishing and maintaining such arrangements (Perrotta & Pangrazio, 2023). Research into digital data infrastructures attends to the multitude of elements that serve to create, circulate and deploy data, including considerations of the technologies and the political, social and economic forces that underpin their rationalities (Hartong & Förschler, 2019). Current research of infrastructures urges that they need to be examined not just for their material components but also perceives them as collections of digital data techniques, technologies and the logics that support their value (Piattoeva & Saari, 2022;

Sellar & Gulson, 2021). Gulson and Sellar (2019) describe the intricacies involved in digital data infrastructures:

> Infrastructure is not simply an underlying arrangement of technical objects and systems, but also includes a variety of more intangible elements and practices: habits of thought, subjectivities, social practices and so on. Infrastructure is thus constituted from, and constitutes, social relations, cultures, desires and beliefs, and in relation to governance, it is constituted by, and constitutes, various modes of both centralised and dispersed power. (ibid., p. 352)

In light of this, data infrastructures must be considered as dynamic and fluid, rather than static entities (Hartong & Förschler, 2019). Lingard (2019) also highlights how current research of infrastructures necessarily extends definitions beyond mere technological considerations towards the inclusion of people and policy.

Data infrastructures as socio-technical assemblages work to transform messy knowledge into usable data for the explicit purpose of creating an objective, comparable viewpoint that can then be governed (Lewis & Hartong, 2022). Understanding that infrastructures encapsulate more than just the technologies themselves, but also the 'platforms, packages and the thickets of code, algorithms, ontologies and standards on which they depend for the functioning' (Williamson, 2016, p. 8), reveals the sheer complexity of their construction. Some elements of the infrastructures are quite overt while others remain hidden from plain sight (Sellar, 2015b). Research into data infrastructures is complex and thus requires an interdisciplinary approach, bringing sociological thinking together with science and technology studies to carefully examine the different components of these complex and dynamic organisations.

Data infrastructures facilitate datafication in wider systems of schooling (Lingard, 2019), while also relying on those very logics to create and sustain the infrastructures themselves. The development of infrastructures is driven by a wider demand for school accountability measures and performance reports (Sellar, 2015b). Webb and colleagues (2020) note how synchronisation is invariably a core feature of data infrastructures, which is reminiscent of the Deleuzian shift to control societies. Piattoeva and Saari (2022) also discuss how infrastructures are 'co-constitutive of affects: infrastructures produce, exhilarate, suppress, circulate and disperse them, yet they may also be the fuel indispensable to sustaining the very existence of the infrastructures' (p. 12). Research using a topological lens demonstrates an approach beyond considering datafication as specific ways of representing things, to 'instead as relationally *bringing these very things into being*' (Hartong, 2021, p. 37; emphasis original).

Issues of safety and consent are important considerations that have been raised in recent research (Pangrazio & Selwyn, 2021), as data infrastructures gather more and more data but also widen their networks of participation. Such concerns have been recently validated, for example, through the security incident involving Illuminate Education and the New York City school system, which crippled the systems and directly caused the complete disruption of learning (Fadulu, 2022). Data infrastructures also serve to create space for *edupreneurialism*, or the rise of private businesses that seek to capitalise on education (edu-business), through actively building school reliance on problem identification software and neatly packaged solutions. Arguably, edu-businesses have been big advocates towards data-based schooling reforms (Wyatt-Smith et al., 2019). Gulson and Sellar (2019) highlight how a case study of the National Schools Interoperability Program (NSIP) in Australia demonstrates how this program create modes of digital governance by bringing together public and private actors all within the same infrastructure. These examples serve as stark reminders that 'data driven-technologies are not simply "deployed" into settings such as schools' (Selwyn, 2021, p. 366), but rather consist of complex infrastructures of human and non-human assemblages that function in a particular way. Examining the platforms and digital technologies, in light of them being manifestations of the processes of infrastructuring (Lewis & Hartong, 2022), means we can interrogate the logics that have shaped their construction and keep their privileged position.

2.5 The rise of platforms

Platforms as technical instruments have garnered much interest in recent years due to their prevalence in everyday life. In schools and broader schooling systems, they have become a necessary part of the datafied landscape to manage the panoply of data at one's disposal. Platforms are an omnipresent concern in many facets of society for the purposes of 'knowing' the world in which we live and operate (Gillespie, 2018; Perrotta et al., 2021). Here, I define *platforms* as online sites and services that provide a digital basis for information and content collected by others to be represented and shared as part of a wider digital infrastructure (Gillespie, 2018). Platforms therefore reveal themselves to be 'spatiotemporal constellations in which user activities become possible and unfold, and transactional data are generated and circulate' (Decuypere et al., 2021, p. 4), in order to 'know' in specific ways. Platforms serve a dual purpose in that they become a necessary intermediary between data and users, as well as being the site by which all user activity occurs and is governed (Komljenovic, 2021). There are specific logics that relate to platforms in educational settings (Perrotta et al., 2021). For instance, platforms become a necessary way of capturing data pertaining to the performances of people working in particular institutions. This

happens through techniques of simplification and standardisation, which serve as the backdrop for decision making to occur (Williamson, 2019). It is here that we see connections with practices of datafication; that is, datafication affords platforms the capacity to automate analyses, which contributes to the further datafication of those captured representations (Pangrazio et al., 2023). Platforms thus help produce these 'data doubles', quantified and optimised versions of human selves, and become irrefutable sites of expertise (Grimaldi & Ball, 2021).

Platforms are often characterised by their *graphical user interface* (GUI), which is frequently conceptualised in terms of the platform's dashboards. The *dashboard* has become a prominent feature on software platforms utilised in educational settings (Knox et al., 2020, p. 34). Dashboards are essential to digital governance in that they provide a way to understand data via a central interface (Sadowski, 2024). Arguably, the logics of the interactive dashboard to see changes in 'real time' have been born from the disappointment associated with some standardised testing that freezes time on progress (Lingard, 2021). There is a significant discrepancy in terms of the lengths of time between different data measures and how frequently they are updated; for example, a whole year between NAPLAN results stands in stark contrast to the rapidity generally associated with data collection and analysis. Other measures, such as attendance, are updated daily, if not multiple times per day. The use of platforms in school inspection processes (Ozga, 2016) highlights the role of inspectors becoming important mediators between the seemingly objective data and future governance decisions. For example, the use of data dashboards in England as part of the Ofsted regulatory requirements to compare the performance of similar schools (Ozga, 2016) depicts a digitalised mode of 'governing at a distance' (Brown, 2021). However, while dashboards are meant to be representative of reality, they can actually 'influence perception so much that they bend reality' (Sadowski, 2024, p. 324).

Consideration must also be given to the *application programming interfaces* (APIs) of platforms, which are 'a central integrative mechanism' (Perrotta et al., 2021, p. 103). APIs are 'formal collections of programming conventions and data restrictions that allow external applications to integrate into a platform' (ibid., p. 103), as well as the source of frameworks for demonstrating interoperability in terms of how data come to be known and then allows connections to other platforms. Here, *interoperability* refers to the way in which different platforms can connect in a coordinated manner across different boundaries amongst different stakeholders (Pangrazio et al., 2023). However, while APIs often provide the necessary framework for entering into a black box of information, they can also act as a barrier in terms of the possibilities of information exchanges within their specific services (Perrotta et al., 2021), as well as deciding who gets access to the information at hand. Platforms hold their own conditions of

possibility about what is known, how it can be known and, importantly, by whom it can be known. This is reflected in research by Clutterbuck and colleagues (2023), who revealed how the API of the *OneSchool* platform in Queensland omitted the ability for recording specific data about Indigenous languages from the outset. Mattern (cited in Sadowski, 2024) explains how 'dashboard designers are in the business of translating perception into performance, epistemology into ontology' (p. 314), a process which I argue can be highly problematic.

Automation, described in this context as amalgamations that use technical instruments to automate processes (Perrotta et al., 2021, p. 104), has also become a necessary consideration of the platforms utilised by educational leaders in schools. Consideration must be given to the functionalities of how specific ways of knowing are automated through means of artificial intelligence. It also raised questions around *what* processes become deemed as automatable, and for *whom* do these processes become automated. Foregrounding the technical elements of platforms to better understand the platforms themselves (e.g., GUIs, APIs, automation) and how these are part of broader data infrastructures helps research view the changing discursive practices of school leaders, as well as their own subjectivities in relation to these infrastructures. This is important given that 'there still is a notable lack of critical educational research that scrutinizes the performative effects of platforms, as well as how these platforms are parts of wider socio-technical assemblages' (Decuypere et al., 2021, p. 2). Importantly, platforms for the most part do not make the content that is inputted, but they do make very important choices about what is collected and how it is represented (Gillespie, 2018). Adopting a 'critical platform gaze' (Decuypere et al., 2021) is imperative, and is:

> an analytical stance that approaches platforms not as neutral 'digital tools', but on the contrary as connective artefacts constitutive of, as well as constituted by, active socio-technical assemblages that are in the process of significantly transforming the educational sector. (ibid., p. 2)

Thus, it is vital that platforms be considered as part of wider infrastructures, given that every platform is a product of exclusive decisions that have been made about what is known and how it is known through specific representations. Studies of the platform alone, in terms of describing its design and features, will not necessarily bring the invisible processes and actors involved into the forefront. The following section examines the role of platforms and broader data infrastructures in regimes of digital education governance.

2.6 Digital education governance

Digital education governance is made possible through the development of platforms, socio-technical data infrastructures and processes of infrastructuring that bring these sets of relations into being. Williamson (2016) highlights the key characteristics of digital educational governance:

> technical systems that are brought into being and made operational by certain kinds of actors and organizations, and that are imbued with aims to shape the actions of human actors distributed across education systems and institutions. (Williamson, 2016, p. 3)

Emerging studies of governance highlight the importance of examining the wider network of modes of governance, as opposed to more traditional top-down modes of policy influence, and how these infrastructuring processes create new digital spaces of governance (Decuypere & Lewis, 2023; Ozga, 2016), as well as new spatio-temporalities. Piattoeva and Saari (2022) describe how data infrastructures create temporal spaces for comparative purposes through which subjectivity is ascribed. They address this using the example of the academic, whose subjectivity is constructed though engagement with publication data that mobilises positive and negative affective responses. Using this conceptualisation illustrates how the possibilities for leadership are reshaped by the infrastructures, in which the principal only becomes knowable in terms of their datafied performance, and their subjectivity is thus formed in this digital space. Hartong and Piattoeva (2021) express how conceptualising data infrastructures offers excellent insight into topological spaces and relations. The topological lens focuses specifically on how spaces of governance are developed and inherent through datafied associations, rather than merely focusing on the *what* of governance by numbers (Lewis & Hartong, 2022). In focusing on the *how*, we can see data infrastructures as dynamic sites of fluid change and development, rather than discrete and fixed entities.

Gorwa (2019) outlines the three modes of governance that have emerged from the production of platforms: *1) self-governance*, which enable users to rely on the platform to govern themselves and their companies; *2) external governance*, in which the platform acts as a site of dataveillance to be seen outside of the company; and *3) co-governance*, a mediated process that sits somewhere between self- and external- modes of governing. A key feature of digital governance in education centres on 'evaluating the present and subjecting the present to predictive interventions' (Witzenberger & Gulson, 2021, p. 420), and pre-emptive technologies become necessary in this mode of governing. Dataveillance seeks to construct a type of 'predictive profiling', where 'the future behaviours of an individual are calculated and then acted on pre-

emptively, using "actionable intelligence" to make decisions and set priorities' (Ozga, 2016, p. 79). The conditions of datafication in education, including the use of digital data technologies, have begun to normalise 'pre-emption over prevention as a predictive practice within anticipatory governance' (Witzenberger & Gulson, 2021, p. 422).

Taken collectively, these educational platforms and infrastructures produce 'thin descriptions' (Ozga, 2016, p. 71) of a particular type of performance, based on numbers that are displaced from original contexts for the purposes of making governance decisions more straightforward. The 'increasingly digital and automated formation, recoding, storage, manipulation and distribution of data' (Hartong & Förschler, 2019, p. 1) have become specific features of digital modes of education governance. Automated decisions ultimately construct the capacity for thought because they determine *what* is knowable and *how* it is to be known (Sellar & Gulson, 2021), reflecting how 'it is no longer enough to automate information *about us*; the goal now is to *automate us*' (Zuboff, 2019, p. 8; emphasis original). Data infrastructures should thus be interrogated in terms of the power/knowledge logics that underpin their development and use (Hartong & Förschler, 2019). As noted by Williamson (2016), the coding and algorithms that lay behind the digital platforms and infrastructures are significantly impacting the enactment of school governance, yet they are largely hidden. It is important then to uncover not only the techniques utilised but also the broader logics that underpin digital data regimes in schools.

As Ozga (2016) explains, policy problems are brought into being via the very representations through which they also seek to intervene in policy problems. Here, we can conceptualise the platforms and data infrastructures involved in governance as a source of ongoing policy (re)production through the machinic fabrication of new policy problems. Given that the 'data must hold the answers' (Hong, 2020, p. 60), platforms and infrastructures entwined in practices of digital education governance serve a productive purpose in that they actively *create* policy problems. The platforms function to create a self-perpetuating machinic cycle in which data are analysed in particular ways and then new problems are generated based on these data. This ultimately reflects the impossibility of continuous improvement agendas in educational leadership, in which always striving to be better ultimately creates a system of failure for school leaders (Heffernan, 2018). There is a need then to look at how the problems are represented (Bacchi, 2009), as well as the analysis of the underlying desires that produce them into reality (Thompson, Sellar, et al., 2022).

2.7 Challenges within digital governance regimes

It is important to consider autonomy within regimes of digital education governance, particularly as it pertains to how leaders know their schools and the autonomy over how this is enacted in practice. Differing states in Australia have somewhat different interpretations of what school autonomy looks like in their respective public-school systems (Niesche et al., 2023). Despite these differences, autonomy has become a largely misplaced term, insofar as it is generally accompanied by increased external measures of accountability that undermine the trust of autonomous agendas in schools. Brown (2021) describes this process as 'steering at a distance', which explains the competing tensions between principals demonstrating autonomy in policy enactment while also being held accountable through compliance measures. As previously mentioned in this chapter, educational surveillance has transformed into dataveillance, a method of systematic ongoing monitoring through the collection of digital data, which serves to reconstruct individuals into data assemblages (Lupton & Williamson, 2017) for performative ranking. It is in this very logic of data that undermines the trust of those working in educational leadership (Ozga, 2016). It is important to note that there is limited research to suggest that increased accountability generates school improvement (Keddie & Holloway, 2020), and that an amplified workload on individual schools and staff often accompanies increased accountability (Thompson, Mockler, et al., 2022). Interestingly, this workload burden is something that principals are not willing to give up for the sake of remaining somewhat autonomous (Heffernan & Pierpoint, 2020).

Consensus is created through an agreed interpretation of the data, meaning there is little room for dissent because of the privileging logics surrounding numbers (Piattoeva & Boden, 2020), as well as their ability to carry a powerful kind of authority (Ozga, 2020; Williamson & Piattoeva, 2019). Educational reforms reshaping decision making and support structures for schools – which purport to improve student achievement and social justice outcomes – have generally not positively influenced workloads and decision-making abilities for principals (Niesche et al., 2023). Brown (2021) points out the lack of involvement from principals in policy development, lamenting that they are largely charged with enactment rather than democratic involvement in policy construction. Autonomy often then becomes a 'double-edged sword for school leaders' (Niesche et al., 2023, p. 13), who are forced to make choices about what to prioritise and how they will demonstrate measures of accountability over decisions made. Eacott (2019) invokes a useful metaphor: principals are so busy learning the rules of the game so they can play it better that they fail to take into account the fairness of the game and the inequities of all the players. This is a sentiment previously established by Foucault (cited in Bacchi & Goodwin, 2016), who describes how 'people know what they do; they frequently know why they do what

they do; but what they don't know is *what* what they do does' (p. 30, emphasis added), ultimately expressing the often-hidden privileging logics that underpin subjectivities and discursive practices.

The constant availability created and sustained through engagement with digital technologies is another challenge that comes with the dichotomy of increased autonomy and decreased centralised support. Heffernan and Selwyn (2023) note how digital technologies like email can contribute to developing and sustaining discourses around the constant availability of principals and leaders and provide little to no opportunity to create definitive boundaries between work and personal life. Dividing the day into binaries of public and private time is no longer applicable for leaders working in schooling systems that are characterised by increasing intensity (Thompson, Mockler, et al., 2022). Similarly, dashboards have become a central feature of governance infrastructures and create both a sense of urgency through the expectation of timely responses to concerns, as well as a sense of agency in taking autonomous charge in response to concerns (Gorur & Arnold, 2021). However, challenges of technical systems prevail in individual schools, which creates a need to turn towards secondary platforms and techniques to supplement perceived downfalls (Pangrazio et al., 2023). The financial and temporal effects of these limitations are significantly heightened for small schools, which often face greater constraints than their larger counterparts (Keddie et al., 2020; Pangrazio et al., 2023). Thus, arguments suggesting that digital technologies and data infrastructures as serving to make the job 'easier' are, in fact, counterproductive to principal wellbeing. Data logics suggest that users will achieve heightened productivity and enhanced transparency, which will result in greater accuracy of judgements and evaluations of performance (Ozga, 2016). However, this is not always so simple.

Related to autonomy then is the notion of resistance, which has been previously explored in the educational leadership research (see, for example, Anderson & Cohen, 2015; Longmuir, 2019; Niesche, 2013). This body of work includes principals being seen as resistant subjects, as well as facing resistance in their role as leader responsible for enacting policy in schools (Starr, 2011). However, research needs to go beyond the perception of resistance as negative to consider resistance as a positive form of agonism, whereby space is provided to challenge and transform the status quo (Mouffe, 1999). That is, rather than seeing resistance as a counterpoint to conformity and a method of categorisation, understanding conflict as a generative and necessary practice in pluralist societies. Standardised ways of teaching and leading can stifle the creativity of educational practitioners (Wescott, 2021) to exercise their own professional judgement and close the door to agonism, effectively shutting off what could be revolutionary ideas for the future of education. There is a noticeable gap in the educational leadership literature regarding the

intersection in school leadership between autonomy and technology. Specifically, the role school leaders play in shaping the technological tools they use to lead their schools, and how far this individual autonomy extends with regards to utilising provided technological infrastructures, is yet to be realised. Perhaps, quite importantly, if platforms and other forms of digital techniques are 'imagined to be "for" their users' (Gillespie, 2018, p. 12), then questioning *who* provides this service on behalf of the thousands of educational leaders who utilise specific platforms becomes a necessary endeavour. With the call from educational leadership researchers for greater democratic process and reasoning in school structures (Niesche et al., 2023), examining the flows in data infrastructures in terms of the logics that shape leadership technologies could give rise to interesting new ways of rethinking school leadership in the midst of datafication.

2.8 Platformed infrastructure logics

While empirical studies have focused on data platforms and their associate infrastructures, there is also a need to consider the broader logics that encompass such infrastructures. This is particularly important in the post-COVID-19 pandemic context in which there was a rapid acceleration in the platformisation of the education sector. This event reflected a 'perfect storm' (Perrotta & Pangrazio, 2023) of conditions whereby huge investments were made to develop digital infrastructures to overcome spatial challenges caused by lockdown mandates. Important consideration must therefore be given to the material components of the data infrastructure (i.e., the technologies themselves, the actors involved in both their development and their usage and the accompanying policy that enact), but also to the processes by which such data infrastructures are constituted and sustained – that is, data *infrastructuring* (Lewis & Hartong, 2021; Piattoeva & Saari, 2020). Examining this process of infrastructuring seeks to make visible the logics not only behind the construction of the infrastructures themselves, but also how they reshape the topological spaces of education through continuous flows in a self-feeding system.

Such examinations ultimately consider platformed infrastructures as being representative of the logics of both platformisation *and* infrastructuring (Perrotta & Pangrazio, 2023). Rather than viewing digital platforms as discrete entities that instil themselves on established systems of education, such an approach considers platforms *as* infrastructures that work to shape the professionals that engage with them. In this way, those working in schools are reprofessionalised in line with the platformed infrastructures; that is, the practices of both school leaders and teachers become entwined with techno-logics. This also creates a process of data infrastructuring (Piattoeva & Saari, 2022) through which a range of 'shadow professionals' (Lewis & Hartong, 2022) emerge to enact and support the infrastructures, even if these roles (e.g., data manager) are quite distinct

from the notional primary purpose of the system (e.g., teaching and learning). These specifically formed professionals, or *data stewards* (Lewis & Hartong, 2021), are tasked to maintain the flows of the infrastructure and include actors from outside traditional schooling roles. The active process of infrastructuring involved in education policy reveals how the human and non-human come together to create socio-technical infrastructures (Clutterbuck et al., 2023; Lewis & Hartong, 2022).

Data infrastructures also create their own conditions of possibility through processes of infrastructuring. They serve to make certain ways of knowing (in)visible and regulate what users can(not) do (Clutterbuck et al., 2023; Decuypere et al., 2021; Hartong & Förschler, 2019), and the precise nature of numbers inevitably means that 'numbers can also be limited and limiting in their range and purview' (Hardy, 2021, p. 45). Clutterbuck and colleagues' (2023) research provide useful insights into the ways the data infrastructures of Queensland's *OneSchool*, and how the structures reflected in the API, paved the way for how student behaviour came to be known: less desirable student behaviours were record in the OneSchool database, perversely rendering the 'good' students as invisible. Adopting a broader perspective of the various aspects of data infrastructures beyond the mere material and technical supports, to also conceptualise the practices in how these supports are developed as well as what they both enable and disable (Sellar, 2015b) are key considerations for critical data research.

Any critical research that focuses on technologies must also investigate them as part of wider data infrastructures, as opposed to just the 'specific technologies … tied up in broader societal processes such as datafication, platformisation, algorithmification, flexibilisation, preemption and psychological governance' (Macgilchrist, 2021, p. 244). Even deeper than the simple 'hidden managers' (Williamson, 2016) of digital infrastructures – such as the software products, shadow professionals and APIs – lie the privileged truths and productive logics that give rise to these technologies as being the best (and perhaps the only) way of properly knowing our schools and their performance. It is these very assemblages, and the resulting data infrastructures, that create new capacities for datafication to occur, as well as policies and practices that help to privilege these logics (Sellar, 2015b). Given the complexity of this field, scholars have sought to use interdisciplinary and sociological conceptualisations, including different theorisations and innovative methodological approaches to investigate these phenomena.

Intersecting this now with how education leadership is generally researched offers an interesting consideration into the potential for future research in these spaces. While leadership offers a well-established place in the educational scholarly literature, much of this research has continually centred the site of leadership as being a product of the individual (Chia & Holt, 2006).

That is, there is a tendency for leadership research to focus on specific traits and behaviours of individual leaders and the impact that this has on individual school settings. Such research is often devoid of critical contextual information about the conditions in which leadership is being practised. There have been a number of attempts to shift towards a more 'post-heroic' body of leadership research to expand the site of leadership analysis (see, for example, Iszatt-White & Kempster, 2019; Spillane, 2005) which has largely been facilitated through a 'theory turn' (Niesche, 2018) towards more critical scholarship practices within this field. Such commitments seek to 'decentre' the leader (Grice et al., 2023) as the locus of analysis and instead consider the broader conditions facilitated by policy and practices. Given that little research has empirically studied the impacts of digital technologies on school leaders (Heffernan & Selwyn, 2023), such methodological inclinations offer useful ways to consider the future study of this key area.

2.9 Adopting machinic sensibilities

Further to the rise in platform technologies and their wider infrastructures comes the consequence of adopting new sensibilities to engage with these epistemologies. Datafication make certain types of knowledge possible, changing what and how people know about education and themselves. This is largely born from the inability to rely on human sense-making abilities alone: the logics of datafication are premised on the very rationality that insights into learning are simply unattainable without data and their framing platforms (Knox et al., 2020). Thus, the pressure to perform under a datafied regime produces a 'need' for technologies. As described by Andrejevic (Sadowski, 2024), 'machines can step in to take on the information load that has become too heavy for humans to bear' (p. 314). Hong (2020) theorises this as *recessivity*, or 'the bargain of knowing but not knowing for myself' (p. 57), and this raises significant moral and political questions about who is knowing on behalf of others and the level of autonomy held within that process. This offers an interesting segue into earlier discussions of school autonomy in which the notion of agency is rather misguided: even without policy that stipulates the use of specific digital data techniques and technologies, other parts of the infrastructure in which those data are used means that school leaders have no choice but to engage.

Research conducted by Williamson and Piattoeva (2019) highlight this intense desire for everything to be quantified so that it can be known in a standardised way. This requires new tools and instruments that have the ability to turn human sense and behavioural markers into numbers that can be harnessed to drive standardisation and improvement initiatives. Such a turn towards recessive technologies also points to the creation of new roles within the assemblage of the data infrastructure, particularly those pertaining to 'data stewards' (Lewis & Hartong, 2022) whose

specific purpose pertains to establishing and maintaining the infrastructures. Callon and colleagues (2009) use the telescope to invoke the removal of science from the real world. This metaphor of the telescope becomes a useful analogy for recessivity; namely, relying on an instrument to help 'see' what cannot physically be seen by oneself. The conditions for how we know and measure school performance have become so complex that it is humanly impossible to do the task. Yet, policy encourages the use of these technical instruments as a way of successfully fulfilling the role. Thus, there is interesting work to be done in this area of machinic sensibilities and how privileged logics shape the policies and practices that determine their application in school leadership.

Research examining techniques of machine learning and sensibilities contribute to a form of machine behaviourism (Knox et al., 2020), which combine behavioural psychology and machinic learning systems to both intervene and shape learners in specific ways. These learning analytics 'nudge' learners (Decuypere & Hartong, 2023) to behave in particular ways, thereby soliciting new behaviours in response to such software systems that ultimately influence the enactment of governance (Williamson, 2016). Ball and Grimaldi (2022) not only question where the teacher is in relation to learning analytics, but more philosophically present the provocation, '*what* is the teacher?' (p. 6; emphasis added). I would argue that the same consideration is necessary to consider the impacts of digital data technologies on educational leadership. Rather than questioning where the leader is in discussions of educational technology (edtech), it could instead be more generative to ask, *what* is the leader? This forces one to examine the changing discursive practices that occur as a direct result of the shifting discourses of educational leadership in response to edtech's increasing expansion into public spaces. Critically, it could also contribute to critical leadership studies that are intent on decentring the leader as discussed in the previous section; in this way, we could specifically consider how the logics of platformed infrastructures are (re)shaping the practices of school leaders.

2.10 Conclusion

As this chapter has demonstrated, there is a clear need for further critical work in the logics and practices of datafication, and how these practices enable the development of wider infrastructures that become a 'necessary' component of educational leadership. The immense effects of datafication have not yet been realised in education literature (Knox et al., 2020). However, it is critical to not be confused with discourses of negativity that seek to polarise objects of research into binaries of good and bad; in fact, research ought to always contain an element of critical thinking as the means of challenging preconceived ideals and drive thinking into new and

innovative spaces (Bacchi & Goodwin, 2016). As captured in the preceding chapters, critical research seeks to progress conversations and imaginaries by making current assumptions and logics implicit to begin a new conversation (Macgilchrist, 2021).

Those working in school settings have never been under more pressure than what we have witnessed in the past two years through pandemic conditions. This raises concern about the stresses schools are facing and what this has the potential to do from a psychological perspective. There is obviously a deserved sensitivity towards those currently working in schools and it should not fall to already overworked school leaders and teachers to overhaul what are deeply systemic (and even societal) issues surrounding datafication. However, now is the very time that we should be interrogating these systems. Ongoing conversations about learning loss are pervading the media and are leading the charge in terms of pressuring schools, principals and teachers to ensure that learning is maximised at all costs. Shifting away from research focusing on arbitrary measures of learning loss, which has become a significant focus during the pandemic (Williamson et al., 2021), to instead look at the critical processes of decision making, for example, is then a worthy and necessary endeavour.

Furthermore, the acceleration of the digitisation of education raises critical questions pertaining to data infrastructures and the structuring of desire and power relations within such assemblages (Komljenovic, 2021). There is an explicit need for the critical and detailed analysis of the processes of decision making and how 'edtech materialities, practices and policies are entangled in these decisions' (Williamson et al., 2021, p. 122). Critical research should always be accompanied by key questions about the values and logics that underpin tech developments and the potential impact on schools and their constituents (Sellar & Gulson, 2021). Critical educational research needs to account for the ways in which digital data technologies shape particular discursive practices through specific digitalised structures but also the sociological premises that give life to the privileging of these practices. After all, 'datafication produces no dimension of epistemic purity' (Hong, 2020, p. 180).

The wider ramifications of platform logics are still largely understudied in the educational research literature (Perrotta et al., 2021), and this is even more so in the literature pertaining to educational leadership. The prevalence of overly simplistic and narrow accounts of educational leadership in the current literature (Niesche, 2018) suggest a strong calling for research that critically considers leadership in light of digital data techniques and technologies. This sentiment is echoed by scholars (Brown, 2021; Heffernan & Selwyn, 2023) who call for more substantive research into the intersection of leadership and policy involving digital technologies, and specifically the ways in which digital technologies are reconfiguring the work of school leaders.

This research aims to contribute to the body of literature pertaining to educational leadership in this way, not only by examining the digital data techniques and technologies that are being utilised in leadership contexts, but to also explore the logics that (re)shape the policy landscape in Australian education as a result of processes of data infrastructuring.

Chapter 3: Theory

Figure 3.1: *The Young Family* (2002) sculpted by Patricia Piccinni.

From *Artsy*, retrieved from https://www.artsy.net/artwork/patricia-piccinini-the-young-family-3. N.d. Patricia Piccinini; Graham Baring.

The Young Family *is a sculpture by Australian artist Patricia Piccinni and part of a collective exhibition entitled,* We are Family. *Deliberately provocative, this piece aims to highlight the perhaps unintended consequences of biotechnology while also challenging viewers to consider what exactly is laid before them – is it human or animal, and does this even matter?*

3.1 Introduction

Following the previous chapter that presented a critical engagement with the literature, Chapter 3 now provides a comprehensive discussion of the theoretical framework developed for this study. Based on the argument that the onto-epistemic complexity of policy (Thompson, Sellar, et al., 2022) necessitates the use of a multifaceted approach to build an adequate understanding, I outline the key theoretical concepts that I use to 'think with' the various parts of this research. That is, I have drawn on theories to explore and ask questions in my research that open new ways of understanding. This has not been a straightforward exercise. Rather, the very process of 'thinking with theory' (Jackson & Mazzei, 2012) denotes the productive role of theory throughout the various (cyclical) stages of the research process beyond the more straightforward elucidation of epistemological dispositions and revelations of methodological logic (Collins & Stockton, 2018). That is, the theoretical components have not just informed the lens through which the research is

to be viewed, but they have also influenced the overall research design itself and many of the decisions made therein.

I was fortunate to attend Patricia Piccinini's *We are Family* exhibition in person, which included the piece *The Young Family* (as depicted in *Figure 3.1*), whilst studying art in secondary school. Though this experience was now some decades ago, the visceral response I felt from being in the presence of these sculptures is far from forgotten. Fundamentally, I remember feeling incredibly challenged by these hyper-realistic sculptures as they forced me to question the very bounds of 'normality'. I stood trying to make sense of what lay before me (at a life-sized scale to boot) by working within what I knew about humans and animals, before coming to the realisation that the point was that I needed to blur these defined boundaries. Similarly, in this thesis, I have been challenged to think differently about how theory can be used throughout my doctoral research. Jackson and Mazzei (2012) explain the process of 'thinking with theory' as inspired by Deleuze and Guattari's (2013, p. 2) phrase 'plugging in', which Deleuze and Guattari use to emphasise the connective tissue of assemblages.[9] It is this practice of 'thinking with theory' that opens possibilities for new and different knowledge, rather than foreclosing and simplifying it, thus providing a 'springboard' of sorts to activate an enquiry. I also align my approach with Spivak (2014, cited in Jackson & Mazzei, 2012), who describes how theory affects our thinking in which 'all of the theoretical reading begins to organize our reading, *not because we are applying it*' (p. 5; emphasis added). Such an approach recognises that thought *by itself* is not something that simply just happens, but it is connected to and activated by encounters. Theory is therefore a critical component of this research, as 'thinking with' philosophers, scholars, theories and concepts – and initiating encounters between their thinking and my own – has influenced all stages of my doctoral journey.

I begin this chapter by outlining the overarching role of the poststructuralist paradigm and what it enables researchers to do in our work, and how I have adopted this for the context of this research. I then connect this thinking to digital policy sociology, which is the specific theoretical framework for this study. I outline the emergence of digital policy sociology as a necessary evolution of critical policy studies to recognise the important role digital technologies play in our

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[9] In the introduction to their text *A Thousand Plateaus*, Deleuze and Guattari introduce readers to assemblage thinking through a connection with Literature, stating that 'when one writes, the only question is which other machine the literary machine can be *plugged into*, must be *plugged into* in order to work' (2013, p. 3; emphasis added). Here, they are emphasising the productive nature of assemblages as being characterised by points of encounter between various machines; that is, the continuous enacting of the new as machinic forces collide.

lives and, more specifically, within education and educational leadership. Following this, I detail the various concepts that have been brought together for this study for the purposes of 'thinking with' theory and method and the empirical, and how they have been given expression as part of an eclectic toolbox across the various parts of this thesis generally, and within the analytical chapters specifically.

3.2 A poststructuralist paradigm[10]

As outlined in Chapter 1 (section 1.3), this research is being driven by three key overarching questions: 1) How are datafication logics (re)shaping the technologies, techniques and subjectivities of educational leadership?; 2) How are digital data techniques and technologies (re)shaping leadership temporalities?; and, 3) How are digital data techniques and technologies (re)shaping how leaders know and lead their schools? Given the types of questions this research asks, I would argue a poststructural approach is necessary to critically examine how datafication generates specific conditions for developing and enacting education policy, in general, and educational leadership in particular.

Poststructuralism first emerged as a paradigm by theorists/philosophers strongly rejecting structural notions of power as (only) being concentrated in hegemonic structures. Rather, poststructuralists became interested in the diffuse nature of power and how it works to shape reality and the knowable, rather than uncovering more traditional oppressed-dominant relational identities. Such a perspective views 'meaning as fluid, blurred, and multiple' (Anderson & Holloway, 2020, p. 193), emphasising how our realities are 'contingent, open to challenge and change' (Bacchi & Goodwin, 2016, p. 4). While a common critique of poststructuralism is that it is not universally understood in one particular way (Bacchi & Goodwin, 2016), there are some quite fundamental onto-epistemic tenets (or theorisations of knowing *and* being) that bind poststructuralist theorists together (Hatch, 2002). The ontology of poststructuralism is primarily concerned with the creation of meaning in multiple ways that are no more privileged than the other, as well as the use of discourses to construct textual representations of individual lives and subjects, via processes of subjectification (Hatch, 2002). Epistemologically, then, there is no *universal truth* that can be known, meaning that poststructuralist analyses focus on the positionality of the subject in terms of discursive and historical formations (Peters & Humes,

[10] Parts of this section have been taken from a chapter co-authored with Tanjin Ashraf and Jessica Holloway, entitled 'Poststructural Analysis in CIE: Discourse, Knowledge and the Conditions of Possibility' in Thomas, jules, Schweisfurth and Shields (Eds.) text, *The Bloomsbury Handbook of Method in Comparative and International Education* (2025).

2003). Here, we accept *truth(*s), as opposed to 'Truth', as '*a matter of perspective rather than absolute order*' (Williams, 2014, p. 14; emphasis original).

In addition to these fundamental bindings, poststructuralists also share a common rejection of four core assumptions:

1) Power is a tangible thing held and used by discrete and determinable hegemonic groups (e.g., by those deemed to be in elite positions through financial or political status);
2) Power relationships exist in a binary fashion – that is, the dominant versus the oppressed;
3) Language reflects a true reality that can be investigated to reveal intentions, power and oppression; and
4) The researcher can sit in an ontologically privileged position outside of discourse to understand what is 'really going on.'

Put simply, these fundamental rejections speak to research that problematises power rather than merely locating it, and which considers how power operates in a highly complex and diffused manner to produce conditions for how we can know and act and be in our world(s).

Broadly speaking, the poststructuralist researcher is typically concerned with 'how' and 'what' questions, rather than 'why' questions (Holloway, 2021). Rather than seeking to uncover an ultimate 'Truth' within a specific object or group, the task becomes pursuing different questions: *How* have things come to be this way? *What* conditions must exist for these processes and practices to be made possible? *How* is discourse structuring what is possible and imaginable at this particular time and in this particular place? Problematising what is being said is the fundamental work of the poststructuralist researcher (Cohen et al., 2017). In this way, poststructuralist researchers do not seek to reject things, but to instead work within them to 'undo their exclusive claims to truth and purity' (Williams, 2014, p. 8), while still understanding that there is no singular truth to ever be known.

Given my use of such a poststructural approach, I should note that this thesis *is not* concerned with measuring the efficacy of data platforms and performance-based policies in educational leadership. Instead, I consider how these mechanisms have come to be known and to matter and, in turn, the condition(s) this creates for leaders when determining what can be thought or said about school performance. This line of questioning seeks to understand the historical, social, political and spatio-temporal factors that have led to particular events, subjectivities and rationalities occurring in a particular moment and place. Bacchi and Goodwin (2016) describe how this manner of thinking fundamentally influences the investigation at hand, as 'the task

becomes investigating *how* it was possible to *do* those things (or to *say* those things)' (p. 32; emphasis original), rather than auditing the effectiveness or impact of said regimes. Thus, I am less interested in whether digital platforms make educational leadership better or worse, and more with how these digital platforms 'make-up' educational leadership.

I should emphasise here that poststructuralist research is also an inherently political exercise (Williams, 2014), insofar as it enables critique from within, as well as the development of new possibilities for research beyond more conventional approaches (Niesche & Gowlett, 2015). That is, poststructuralist research requires the examination of practices as we know them, from within the very space of the critique itself. Such immanent forms of critique privilege what is made possible in any given situation and addresses how we might work within such situations (Sellar et al., 2014). There is no assumed detachment of the research and the researcher (Piattoeva & Saari, 2022), and such an entanglement should be readily acknowledged from the outset (something which I do in the Prologue and then reiterate at many other points in this thesis). The conceptual framework that this research draws on similarly recognises the impossibility of researcher innocence (Colebrook, 2002b, p. xiii). As Bennett (cited in Buchanan, 2021) notes, 'reality does not speak to us objectively, and no scientist can be free from constraints of psyche and society' (p. 24).

While poststructural research approaches occupy a significant space in educational policy research, an enduring critique is that this form of research does not offer a meaningful contribution that can effect change (Humes & Bryce, 2003). The critique is that poststructural analyses are highly adept at *identifying problems* but are not so great at *providing solutions*. At the same time, however, many poststructuralist scholars (myself included) do not deny this characterisation of their work. Rather, they embrace their will to problematise (rather than solve) critical issues that societies and populations face. Additionally, I would argue that the problematising work in which the poststructuralist partakes is a necessary first step to considering possible solutions. We must unsettle the ground on which we walk (and talk) to consider how it could be otherwise.

3.3 From policy sociology to digital policy sociology

Much like how poststructuralist thought emerged through challenging the structuralist paradigm (Rae & Ingala, 2021), policy sociology developed in response to growing dissatisfaction with the then-dominant forms of policy research. Defined as an approach 'rooted in social science tradition, historically informed and drawing on qualitative and illuminative techniques' (Ozga, 1987, p. 144), policy sociology describes the shift away from more evaluative policy research that

dominated the field at the time.[11] Rather, Ozga proffered that policy research ought to draw attention to the various manifestations of power relations inherent in both policy and the policymaking process, rather than focusing on the effectiveness of policy development and implementation (Lewis, 2021). Such a suggestion was an attempt to 'push back against powerful trends' (Ozga, 2021, p. 292), such as taking more 'rationalist' (Ball, 1993) approaches to understanding the 'first-order' effects of policy in terms of what a policy is intended to do and whether it achieves the desired outcomes. Instead, empirical attention needed to be drawn specifically to 'the underlying assumptions that shaped how a "problem" was conceptualised and how "solutions" were selected' (Ozga, 2021, p. 294), and, importantly, by whom. This approach means research should be concerned with scrutinising policies for how (and by whom) they have been produced, rather than accepting them as concrete entities that reflect an objective rationale.

While these core logics of policy sociology have endured since Ozga's original definition, there has been a necessary uptake of new conceptual tools and empirical sites for analysis to contemporise policy sociology studies. Education policy is now seen to transcend the traditional bounds of the nation-state by actors who also frequently (but not exclusively) sit outside of traditional sites of policy formation (Lewis, 2021); this brings forth new sites for analysis. Similarly, what counts as policy has also evolved to account for the range of forms that education policy can now take without it being specifically named as such, including department websites, school promotional texts and (significantly for this research) digital data platforms. While such artefacts are not reflective of more 'formal' policy texts (i.e., those that are specifically labelled as policy documents), they nonetheless operate by communicating specific values and discourses for certain audiences (Stacey & Mockler, 2024). In this way, they typify Easton's (1953) broad definition of policy as being concerned with the 'authoritative allocation of values', as the critical analysis of more 'informal' policy texts can offer valuable insights into Ozga's original attention towards the power relations inherent in policy. In this thesis, for example, digital artefacts, such as the data platforms and school-level strategic planning documents, are clear examples of 'informal' policy texts for analytical purposes, as they offer valuable insights into the socio-political context in which they have been formed and implemented. Importantly, they are merely

[11] Like poststructuralism, policy sociology has a history of avoiding 'watertight definitions' (Ozga, 2021, p. 290) and has instead been defined more by the *whom*, rather than the *what*. That is, there is a *politics of naming* (Savage, 2021a) associated with policy sociology, in which scholarly fields of thought are categorised by readers based on those who are cited. I cannot deny my participation in this discursive practice; throughout this thesis, particular scholars have been named to signal their relevance to the study. In this way, my citations are a political act that demonstrates my alignment with specific researchers and their standpoints.

'informal' in a comparative sense when contrasted with more established ways forms and ways of doing policy, and this itself justifies changing our research approaches in line with the empirical changes occurring.

One such change has been the development of *digital policy sociology*, which is a 'tentative category for studies combining policy sociology analysis of the production of policy-relevant knowledge with digital sociology studies on the role of digital methods in producing new forms of knowledge' (Williamson, 2021, p. 359). Such an approach directs one's analytical gaze specifically towards the *digital* processes of knowledge construction within policy practices. This includes the various software (i.e., operational coding programs), hardware (i.e., physical computation devices) and infrastructures that support them – following Perrotta and Pangrazio (2023), these include both physical mechanisms and social phenomena, or the *socio-technical*. Digital policy sociology thus requires researchers to problematise the power relations explicitly associated with technologies within policy regimes, such as considering how technologies shape the conceptualisation of education 'problems' and 'solutions'. Importantly, it requires us to consider how knowledge production is being (re)shaped through the advancement and naturalisation of digital technologies in educational settings. Again, such an approach enables us to consider the previously outlined and poststructural questions with a dual focus on digital technologies and policy: How has *policy* come to be this way *in light of digital technologies*? What *digital technology* conditions exist for these *policy processes and practices* to be made possible? How are *technological discourses* structuring what is possible and imaginable at this particular time, in the context of *Australian education leadership*? In this way, I view digital policy sociology as embedded in similar logics of policy sociology with the same critically infused intent found in poststructuralist thought, producing a *matryoshka*-like alignment between these three core terms (see *Figure 3.2*).

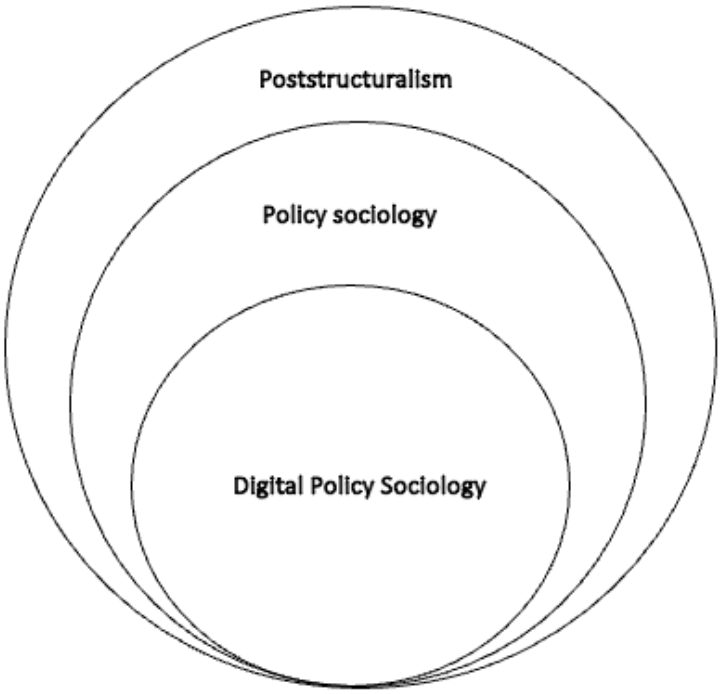

Figure 3.2: The alignment of the broad theoretical approaches used in this thesis.

Digital policy sociology is therefore a hybrid of sorts, bringing together digital sociology (Beer, 2016; Lupton, 2015; Selwyn, 2019) into conversation with policy sociology (Bacchi, 2009; Ball, 1997; Ozga, 1987; Rizvi & Lingard, 2010). As a sub-discipline of sociology (Lupton, 2015), *digital* sociology acknowledges the profound impact that emerging digital technologies play in shaping everyday life. Digital sociology approaches have generally been used to respond to technological impacts in broader society, rather than being specific to education. It has involved incorporating theory and concepts from science and technology studies (STS) into the field of sociology to understand the relational dynamics therein. In this conjoined space, as Gulson and colleagues (2022) state, 'technology is not discrete from human relations' (p. 5), but it is rather a joint cultural undertaking to be critically explored. Much like how policy sociology emerged to challenge the overly positivist trends in education policy research by bringing the very politics of policy to the fore (Savage, 2021a), so too was digital sociology born out of necessity to engage with the contemporary tech-heavy world. When tentatively brought together, these two fields extend one another's limits by bringing in new tools to both novel and enduring conversations. In this way, digital policy sociology provides us with a framework to attend to the particular digital ways of knowing in education and how this pertains to policy.

While digital policy sociology is a novel approach within the field of education research, it is built on an extensive field of prior approaches that initially began outside of education. The

sociology of numbers, for example, represents a key body of multidisciplinary research that draws largely from the disciplines of sociology and STS. This work critically examines the use of quantifiable metrics within governance institutions in the name of increasing objectivity and neutrality within key-decision making processes (see, for example, Desrosières, 1993; Porter, 1995). Such thinking has been instrumental in educational research, with scholars drawing on it to discuss policy-related issues such as the implications of high-stakes accountability and standardised assessment regimes (see, for example, Hardy, 2014; Lingard & Sellar, 2013). Similarly, *platformisation* was made prominent within the field of media and communication studies to describe the role of digital platforms in (re)shaping various aspects of life, in response to both earlier work on digital platforms and the exponential rise of data's volume, velocity and variety (Kitchin, 2014). Prominent scholars used this term to outline the various ways that digital platforms transform fields (i.e., medicine, politics, education) through mechanisms of governance (see, for example, van Dijck, Poell & de Waal, 2018; Gillespie, 2018). This has subsequently prompted education policy scholars to consider platformisation specifically in relation to education, such as how it impacts teacher professionalism (Lewis & Decuypere, 2023), creates new spaces of policy and governance (Decuypere & Lewis, 2023) and how parents are viewed as professionals in their children's education (Hartong & Manolev, 2023).

A central commonality to the theories and concepts brought into educational policy studies from external scholarly fields relates to the way in which they are deployed. That is, theories and concepts are viewed through poststructural lenses to make sense of *how* policy is constructed, thereby problematising the very premise of policy. While still somewhat of an emerging field, digital policy sociology nonetheless remains committed to the original critical disposition of policy sociology (Savage, 2021a). Digital policy sociology functions with the same critically infused intent, but with a specific focus on the role digital techniques and technologies play in shaping policy and practices. This is particularly important given the prolific impacts that 'big data' is having on all realms of social existence due to the '3 Vs' of data *volume*, *velocity* and *variety* (Kitchin, 2014) and their productive capacities within our present world. In an educational research context, a digital policy sociology approach enables the study of the role and the influence of digital techniques and technologies within more conventional educational policies and practices (Williamson, 2021).

Additionally, as an emerging field, there is a necessity to bring new thinkers and concepts to the conversation. There is presently a theoretical familiarity across scholarship associated with critical policy studies and the digital aspects of education policy. For example, the field of policy sociology is very well-versed with Foucauldian scholarship (as is the field of critical educational

leadership research) that premises policy (and its problems) as something constructed and brought into being, rather than something that pre-exists in the world out there waiting to be found. Foucauldian concepts of discourse, power and governmentality have been frequently used to problematise policy through a sociological lens (see, for example, Bacchi, 2009; Ball, 2003; Heffernan, 2018; Holloway, 2020; Niesche, 2016). Similarly, there has been a significant uptake of Deleuzian-Guattarian assemblage theory in more recent policy scholarship to problematise how certain policies are made to matter in specific contexts (see, for example, Lewis & Spratt, 2024; Thompson et al., 2022). The blurriness of the bounds of a field like policy sociology has meant that an eclectic array of thinkers and concepts have been introduced to this field of study, and digital policy sociology is no exception to this (nor should it be).

Much like how the technical turn has necessitated attention to the *digital* in the field of policy sociology, we also need to draw on additional (or out-of-field) thinkers and concepts to problematise these regimes. Like we have seen in the field of policy sociology through, for example, the uptake of mobilities concepts from the field of critical geography to understand how education policies are being realised in relational spaces beyond the typical nation-state (Gulson & Sellar, 2019; Lewis, 2021), digital policy sociology as an emerging area has much scope for evolution, adoption and adaptation. To critically analyse evolving schooling regimes in a time of prevalent data logics means evolving our theoretical and methodological toolkit to deal with such complex times. This does not come without risk. There is an explicit need to be mindful that as concepts migrate into new spaces, they very often become 'lost in translation' (McKenzie et al., 2021). This serves as a reminder to return to the original texts of thinkers to understand concepts before attempting to apply them elsewhere, rather than simply trying to understand them solely through secondary sources. The next section details the toolbox approach that I have developed to analyse the data in this research and offer new contributions to the existing field of literature. I consider the origins of where the selected theoretical concepts have come from and how they can be used productively under the digital policy sociology framework for this thesis.

3.4 Deploying a toolbox approach

For this thesis, I have developed somewhat of an eclectic 'toolbox' of concepts that I have found useful in mobilising the digital policy sociology theoretical framework. Much like in the spirit of how digital sociology pulls theory and concepts from more STS-aligned work, I too have pulled these concepts from outside of the general paradigm from which I am working (i.e., poststructuralist policy), as evidenced in *Figure 3.3*. Specifically, I have drawn on concepts previously developed in the context of datafication studies (with a technological orientation),

including *recessivity* (Hong, 2020), *data hygiene* (Mulvin, 2021) and *metric fixation* (Muller, 2018). Following Hong (2020), I draw on Wittgenstein's (1969) *groundless grounds* in relation to recessivity to explore this connection specifically in relation to education. Similarly, I bring together *temporal horizons* (Luhmann, 1976) with data hygiene (Mulvin, 2021) within the context of digital policy sociology. In this way, the concepts have been used to bring new meanings and understandings to the field, for 'a concept in its philosophical sense moves beyond any example or model to think the very power of possibility' (Colebrook, 2002, p. 17). Concepts must give us the impetus to move thinking forward in such a way that it enables virtual potentialities to be considered. That is, they should enable us to think of things in a manner that acknowledges the dogma of thought and, rather than aligning with it, chooses to see things as otherwise, creating different ways of thinking and being.

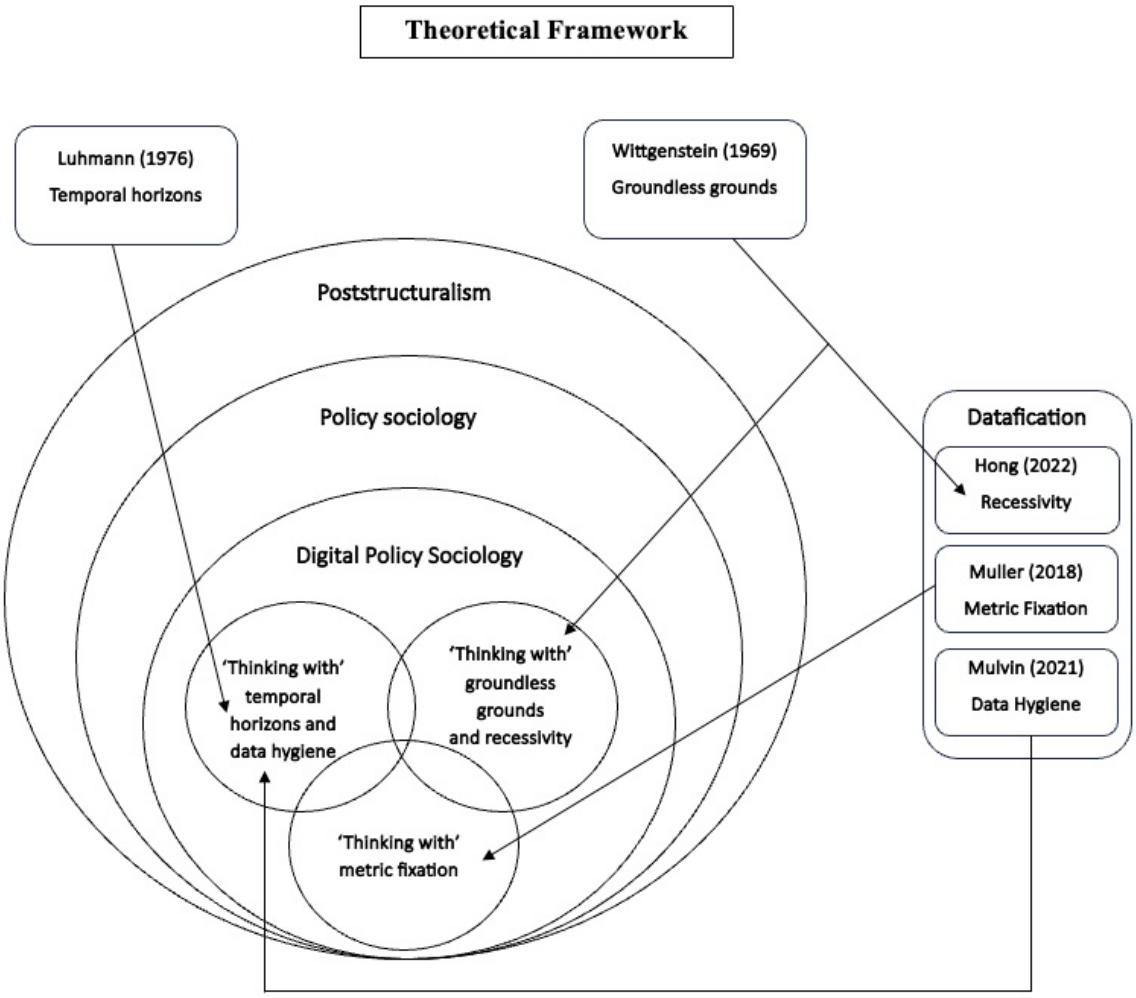

***Figure 3.3**:* A diagram of the theoretical framework for this study.

Such an approach has been an exercise in iterative experimentation. It has been messy and unsettling work as well as being deeply thoughtful and productive. As mentioned at the outset of this chapter (section 3.1), Jackson and Mazzei (2012) liken the process of 'thinking with theory' to that of the Deleuzian concept of 'plugging in' (Deleuze & Guattari, 2013, p. 3) – taking one thing (like a theory/concept) and proverbially plugging it into another (like some data) to see what is produced as a result. I explain the analytical application of this approach further in the next chapter (section 4.7). Both Foucault and Deleuze (and Deleuze's work with Guattari), who are both influential to the onto-epistemic thinking that accompanies the selected tools in the specific context of this research, were quite vocal about their hopes for their theories and concepts to be deployed in a toolbox way. Similarly, Ball (1993) promotes the need for a diverse 'toolbox' of concepts and theories to analyse policy, given its inherent complexity. While the selected concepts may not have been specifically designed with either poststructuralism or digital policy sociology in mind (particularly for Wittgenstein and Luhmann, whose core work precedes the onset of poststructuralism), I have sought to deploy them in such a way that reconciles with these approaches. That is, I have used these concepts in a way that seeks to problematise the use of digital data techniques and technologies in how they are (re)shaping educational leadership through policy, particularly considering school performance discourses.

This is important to note, as there are some apparent onto-epistemic misalignments between some of these concepts in their original contexts, especially in relation to the field of digital policy sociology. Technologies of datafication are dependent on the belief that technical tools can offer the means through which the world can be seen objectively, and therefore more accurately. However, poststructuralists typically depart from Enlightenment principles when deploying datafication as a theoretical concept, arguing that all technologies (and the discourses that constitute them) are far from 'objective' and are subject to the same language and power relations that construct all meaning. However, as Hong (2020) notes, it is not simply a case of rejecting this contextual knowledge, but rather of seeking to further problematise these premises. For example, this might entail acknowledging there is a paradoxical element associated with technologies of datafication, in that these technologies rely largely on Enlightenment ideals of objectivity and human reason and yet, at the same time, threaten to destabilise the democratic freedoms of individuals and collective society (p. 16).

As I discuss in greater detail in the next chapter (section 4.7), developing an appropriate toolbox of theoretical concepts for this thesis has been far from simple work. It has involved *a lot* of wide reading; in many ways, this thesis could have been written multiple times over based on my different 'thinking with' experiences, each of which producing different outcomes. In many

cases, my 'thinking with' a range of scholarly thought has led to fruitful productions, which I hope is evident in the analytical chapters that follow later in this thesis. However, it has also been a painful exercise in 'letting go' of scholars and their thinking when it does not fit the overall analytical framework. Ball (2006) acknowledges that not all theories can work effectively together and implores the need for coherence when making decisions about which theories to include. This has been a huge personal challenge, particularly for a theory I have determinedly followed (i.e., Deleuzian-Guattarian assemblage) and see as being useful for the field more broadly, but it did not align with the rest of the design used for this research. Alas, such tools still sit in my broader theoretical-conceptual toolbox, awaiting their opportunity to be 'put to use' (Foucault & Deleuze, 1973) in future research. Nonetheless, I now focus on the specific theoretical concepts that I have 'thought with' to conduct the data analysis presented in Chapters 5 through 7.

3.4.1 'Thinking with' groundless grounds and recessivity

Wittgenstein's *groundless grounds* (1969) is a useful way of considering the contingency of our ontological-epistemological understandings of the world. He used this term to highlight how our ways of 'knowing' in a particular time and place are inextricably linked with the very conditions of that time and place, much like Foucauldian theorisations of discourse (Foucault, 1972). Over time, how we see the world forms a kind of epistemological grounding or foundation that serves the purpose of 'propping up knowledge' (Braver, 2014, p. 174); in short, it is how we make sense of and participate in the world around us. However, these grounds are ultimately *groundless* insofar as their only source of legitimation is themselves; that is, they become buttressed by their own virtue (Holloway et al., 2023). While such foundations ground an age and shape what is knowable and doable in a particular epoch (e.g., the difference between pre- and post-Enlightenment Europe), they are also malleable and open to change over time. Such change happens as a part of life's encounters: 'no matter how clearly the world seems to take us by the hand and lead us, it is always up to us to recognise its authority and interpret its commands' (Braver, 2014, p. 181).

Building on Wittgenstein's earlier thinking, Hong (2020) uses the concept of 'groundless grounds' to critique datafication, and specifically how it produces chimeras, or illusions, of certainty and objectivity despite no firm epistemological foundations. He interrogates the onto-epistemological foundations of datafication (i.e., data offer us a more neutral and more trustworthy means for making decisions) as fundamentally problematic, given that systems of data are premised on speculative measures that often conceal the various socio-political and ethical dimensions of such regimes. Relatedly, Hong explains that to *know in* particular ways through and

within datafied regimes, there can also be a need to *know through* certain mechanisms. Hong (2020) theorises this as *recessivity*, which he describes as 'the bargain of knowing *but not knowing for myself*, sensing but not sensing for myself' (p. 57; emphasis added). In datafied regimes, digital data techniques and technologies become a critical part of the broader infrastructures for participation. They act as a sort of epistemological lens through which data can be viewed and understood.

Consider, for example, a microscope here. It is a scientific tool for accessing phenomena beyond the human scope of (visual) possibility. A microbiologist might require a microscope as part of their regular work; this is not something that is overtly stated but it is rather an implied norm. The microbiologist is not seeing nor sensing the actual cells or tissues for themselves but is rather seeing the actual *through* the lens of the microscope – they are seeing, in effect, what the microscope sees *on their behalf*. In this way, the field of microbiology can be considered as a groundless ground, since it functions as a scientific epistemological foundation for a scientific discipline highly contingent on historically situated understandings. As technology continues to develop and influence the type of information able to be gathered, the epistemological foundation of what constitutes 'good' research in the field of microbiology also develops. Technological mediation (through specialist tools, like the microscope) is required to construct understandings of microbes rather than the scientist being able to directly observe them, thus rendering the epistemological foundation as unstable, and essentially 'groundless'. Applications of recessivity have both political and ethical implications (Hong, 2020); how thinking is extended beyond human perception limit leads to important considerations, including who (or what) is knowing on my behalf and the broader implications this has. To return to our microscope example, generating knowledge through the discipline of microbiology is only possible if it has a firm foundation beneath it (ontological, epistemological, technological...) and the scientist values and embodies this foundation. Applications of recessivity have both political and ethical implications (Hong, 2020); how thinking is extended beyond the human perception limit leads to important considerations, including who is knowing on my behalf and the broader implications this has.

When taken collectively, Wittgenstein's (1969) groundless grounds and Hong's (2020) recessivity offer mechanisms for problematising the very foundational use of digital data techniques and technologies in educational leadership. In Chapter 5, I extend on the theorisations made by Hong (2020) to consider the dependency on recessive technologies in the regimes of datafication that frame our understandings of school performance. Using these concepts in a poststructurally-informed manner enables us to problematise the ground on which current methods of digital data use in educational leadership stand and to consider how they have come

to be this way. Importantly, these concepts attend to the digital aspects of policy regimes and challenge the very assumptions of neutrality that both the groundless grounds of datafication and the subsequent uptake of recessive technologies are premised on.

3.4.2 'Thinking with' temporal horizons and data hygiene

Sociologist Niklas Luhmann wrote much about temporal structures, or the social systems of time organisation, in society and the way in which they are used to manage the complexity of time. Luhmann emphasised that temporal structures are active constructs produced within communication and help to bring meaning to modes of communication (Luhmann, 1976). Much like poststructuralist perspectives of discourse, temporal structures do not just exist 'out there' waiting to be found, but they rather are connected to the very experiences of the individuals that participate in their regimes. Luhmann identified the relevance of linguistics in shaping time modalities, or the very ways in which social systems relate specifically to time. He defined three key temporal modes – past, present and future – and proffered that such temporal modes can only be understood through their relationship with one another. A particular modality of time is directly related to our perception of it: my understanding of what constitutes 'the past' may be everything that has happened up to a particular point, but what is that definitive point and how does it function? Such a rendering also implies that the past is some 'static being' (Colebrook, 2002b, p. 77), rather than something that can be actively reshaped through interaction with the present. Likewise, at what point does the 'present' mode of time become the 'future'; or, perhaps more appropriately, when does the future become the present?

Luhmann sought to problematise the conflation of chronology and time through his conceptualisation of the *temporal horizon* (1976), or a 'future that cannot begin' (p. 143). Much like the visual horizon always remains out of reach and constantly 'moves away' (ibid., p. 143) as we approach it, the temporal horizon acts as a relational construct that keeps our gaze structurally oriented to the future, moving towards it and yet incapable of reaching it definitively. Temporal horizons offer us orienting systems in that they refer to future expectations by referencing specific past memories and trends. In datafied regimes, temporal horizons are created through engagement with data shaping practices. In this way, data are used to make predictions about the future. However, as discussed in the previous section, the data are far from being neutral commodities and have previously been enacted on to make them meaningful in the contexts they are being considered. That is, the data are formed on a specific foundation that is highly contingent upon the present context; a present which is also deeply influenced by the past.

However, it is also important to recognise that any predictions about the future are made within the context of data that has been presented in a highly specific way. *Data hygiene* (Mulvin, 2021) is a way of considering the cultural and socio-political practices of 'cleaning up' data to be of use in given situations, particularly in regards to considering the temporal horizons. Hygiene refers to the practices of bringing order to previously disordered content, creating matter that is 'cleaner' and thereby more trustworthy (Mulvin, 2021). Hygiene implies a particular standard, or a shared benchmark; a fixed point through which comparison is made possible. We saw this play out throughout the pandemic; a collective notion of 'hygiene' was curated and provided to the public in order to stay safe and clean from Covid. Signs and instructions showing how to correctly wash your hands; sanitising stations everywhere; masks of differing degrees of effectiveness, and so on. All of these created a standardised notion of cleanliness that would protect us from the virus; a standardisation deeply entangled in a particular cultural and socio-political context.

When taken together, these two core concepts once again enable a poststructurally aligned problematisation of the temporality around digital data techniques and technologies. Luhmann (1979) states that 'we experience our future as a generalised horizon of surplus possibilities that have to be reduced as we approach them' (p. 141). I find this particularly relevant for considering the concept of data hygiene, with hygiene being a reductive process in and of itself. There is an inherent assumption that a foundational shared agreement of what constitutes erroneous information that must be 'cleaned away' exists (Mulvin, 2021). This also points back to Wittgenstein's groundless grounds as discussed in the previous section and the need to problematise practices of data hygiene as something that does not just exist 'out there', but rather as contingent upon the socio-temporal practices that animate them. Processes of data hygiene are also of particular relevance to the concept of recessivity, in that they are often associated with technical mechanisms to enact the data 'cleaning'. However, these mechanisms are often far from being the neutral devices they regularly purport to be but are instead representative of what has been made possible on the groundless grounds on which they have formed. I apply this thinking in Chapter 6.

3.4.3 'Thinking with' metric fixation

Finally, I arrive at Muller (2018) who offers a critical perspective on the use of metrics in a range of different professions, including those pertaining to education, medicine, law enforcement and business. Like Hong (2020), Muller is not critical of metrics in and of themselves, but is instead interested in how *metric fixation* sees quantifiable measures being used in unintended ways that are often both oppressive and dysfunctional. In this way, human judgement becomes rather

unfashionable while regimes of measurement become the 'it' crowd of society. By proxy then, organisations and individuals that incorporate policy mechanisms that supersede human judgement for quantified metrics are considered to be elite through their commitment to evidence-based practices.

Metric fixation is underscored by three interrelated beliefs (Muller, 2018, p. 18):

1) That it is both conceivable *and* preferable to replace human-centric judgements with quantifiable, standardised metrics.
2) The publication of the aforementioned metrics brings about organisational transparency and accountability.
3) Motivating people within these organisations is best done through coupling financial and/or reputational rewards (and, conversely, penalties) to their metricised performances.

Metric fixation results when these beliefs are put into practice and continue to endure in spite of their negative unintended consequences. Much like regimes of discourse, it becomes challenging (if not impossible) to consider what the outside of these regimes might look like.

The concept of metric fixation prompts us to identify the often-unintended negative consequences of substituting human judgement for standardised measures. For example, in the field of medicine, surgery statistics have been made high stakes not just because of their obvious relation to human life, but also because of the various policy regimes that include these metrics. This can have (and has had, as Muller outlines) serious consequences (hopefully unintended) for surgeons and patients alike. Patients have been denied surgery due to their inherent 'riskiness' as defined by their quantifiable health measures; that is, patients presenting with co-morbidities that come with higher (numerical) risks of complications and/or death are identified as non-ideal surgical patients. This is explicitly connected to the remuneration of performance-pay for 'underperforming' surgeons, with 'underperforming' referring to patient morbidity as a direct result of surgery. Put simply, metric fixation sees surgeons prioritising a higher surgical success rate (due to pay and reputation) over the wellbeing of quantifiably high-risk patients.

Such an examination of the unintended consequences of quantified metrics has previously been explored in education policy scholarship (see, for example, Lingard & Sellar, 2013) and is arguably a key feature of studies in the field of digital policy sociology. From this perspective, metric fixation can be used as a concept within this framework due to its critical disposition and the immanent form of critique that it instigates. I intend to add to the existing critical scholarship in this area by mobilising the concept of metric fixation through Muller's identification of how the application of metrics can '*distort*, *divert*, *displace*, *distract*, and *discourage*' (p. 4, emphasis

added). All five of these alliterated verbs share a commonality in how they demonstrate enacted interference with the expectations of encounters with data. While data usage promises to provide objective views of school performance, the actuality of this is flawed when the data are considered as part of their broader platformed infrastructures. In Chapter 7, I use these concepts as a framework for considering the relational aspects between the platforms and the principals; that is, how the encounters between the leader and the data representation techniques are (re)shaping how educational leadership is being enacted. The concept of metric fixation allows us to consider how the platformed infrastructures endure even in spite of the problematic encounters between the platforms and the principals.

3.5 Conclusion

This chapter has outlined the importance of theory within this inquiry. I discussed the role of poststructuralism and identified how I am using it within this thesis (in spite of some enduring negative commentary around its worth). I also outlined digital policy sociology as my key theoretical framework and explained its evolutionary relevance to policy sociology in particular. I then presented my 'toolbox' that has been curated for this thesis; an eclectic array of theoretical concepts that have been brought into the digital policy sociology framework from external fields in order to adequately address the complexity of education policy in a time of 'big data'. Some of these concepts have an overt familiarity in the field of education policy scholarship, for example, theorisations of datafication have been used in numerous studies to demonstrate how metrics are reconfiguring education. Others have more of an associated familiarity with education (i.e., through systems of governance like those found in both education, medicine, etc.). However, I believe that a sustained treatment exclusively in the context of education can offer a novel contribution to an emerging field such as digital policy sociology. The deployment of these concepts is not just about affixing labels to enduring problems, but are rather encounters for considering things deeply and differently. Much like how Piccini pushes the boundaries of conventional thought in *The Young Family*, I too seek to push the novel field of digital policy sociology forward through the integration of theoretical concepts from outside of the field in order to open up new possibilities for thought to emerge.

Importantly, through the very act of 'plugging in' to theory, I am a part of the working assemblage. However, as a poststructuralist researcher, I both accept and embrace this as a part of my ontological-epistemological purview, with the caveat that the most important aspect of theory is the way in which it is deployed. Deleuze emphasised this very point: 'a theory is exactly like a box of tools. It has nothing to do with the signifier. *It must be useful*. It must function' (Deleuze,

in Foucault, 1977a, p. 208; emphasis added). Put differently, there is a need to not simply understand the theory at hand, but to also demonstrate its use in a practical and empirical way. To this end, I argue that like Foucault, who wished for researchers to use his tools in a way that fits the purpose of the research, Deleuze would also (I hope) understand this research here not as a final product but as a moment of becoming, somewhere along the continuum; that is, a proverbial pause that produces a present moment's understanding of a constantly evolving thinker.

Chapter Four: Methodology

Figure 4.1: *The Starry Night* (1889), painting by Vincent van Gogh.
From *MoMA*, retrieved from https://www.moma.org/collection/works/79802. 2025 Museum of Modern Art.

Considered by many to be his magnum opus, this painting is indicative of an amalgamation of artistic styles referred collectively as post-impressionism, an epoch in which Impressionism was extended upon to produce new stylistic artforms.

4.1 Introduction

After introducing the theoretical resources that guide this research in the previous chapter, I now turn to an explanation of the research design, methodology and methods used to conduct this project. I begin by briefly revisiting poststructuralism as the overarching research paradigm and explain its connection to the theoretical framework of digital policy sociology that underpins this project. I then discuss the research design, which follows Comparative Case Study (Bartlett & Vavrus, 2017) and introduce the two central cases being explored, namely *Panorama* and *Scout*. These cases are what I refer to as *platformed infrastructures* that centre around two digital data platforms used by Australian State Departments of Education and the policy and practices that ultimately animate them. I discuss the methods employed to collect data for each of these cases

and the analytical strategies I deployed, including a discussion of the ethical considerations throughout various stages of the research design.

Importantly, this chapter considers what one needs to do this kind of research in spite of the various structural and personally reflexive constraints I have experienced. Van Gogh painted *The Starry Night* and many similar works during the day and while hospitalised, unable to access the night sky in person. Nonetheless, he still managed to deliver a visual delight; one that abandoned photographic semblance in favour of passionate expression which aligned with other post-impressionist artists. Much like van Gogh, I use this chapter to explain my research of digital data platforms while having limited physical access to the platforms themselves. I explain how I deployed methods that enabled me to build a working picture of the platforms to consider their role in shaping how leaders think about their schools and the discursive consequences of such thinking. This serves as a good reminder that getting creative and thinking differently about the possibilities for conducting research about leadership, and drawing on sources in addition to the conventional leader voices, can help to overcome the many ethical and physical challenges of doing education research at this time.

4.2 Research paradigm and theoretical framework

As outlined in Chapter 3, this thesis is grounded in the philosophical underpinnings of poststructuralism, a theoretical paradigm that enables researchers to trouble the taken-for-granted aspects of everyday life and practices by considering how these have come to be. As previously explained, this type of approach enables researchers to ask a broad range of questions: *How* have things come to be this way? *What* conditions are required for specific practices to be made possible? A poststructural perspective views all practices as contingent constructions from the outset; practices that are developed by human actors rather than merely existing as enshrined truths (Bacchi & Goodwin, 2016). Such an approach then seeks to understand the historical, social, political and spatio-temporal factors that have led to certain rationalities being formed. With the aim of this thesis being to develop a better understanding of whether, and (if so) the extent to which, digital data discourses are reconfiguring school leadership, the alignment with this paradigm is important. Considering how leaders are discussing their school's performances and what has influenced these conversations being made part of the dominant leadership vernacular is a core focus and aligned with the fundamental principles of a poststructuralist approach.

Relatedly then, digital policy sociology informs the theoretical framework for this study. As previously explained (see section 3.3), digital policy sociology is an evolution of policy sociology, in which the profound impacts of digital technologies are explored in relation to policy

construction. While still an emerging field of study, criticality is an essential component of this approach through the acknowledgement of how knowledge production is being (re)shaped through the advancement and naturalisation of digital technologies in educational settings. In many ways, this creates much overlap with other pre-existing fields of studies, including critical platform studies and critical policy studies. Arguably though, digital policy sociology offers a way to attend to these various forms of study in a more reconciled way.

Digital policy sociology allows for the examination of how leaders are being reprofessionalised in the wake of data. I use the term *re*-professionalised here intentionally; there have been many studies attending to the de-professionalisation of teachers (see, for example, Daliri-Ngametua & Hardy, 2022; Mills et al., 2024; Wescott, 2022). Digital data discourses are creating rigid ontological views of what it means to be a school leader, and what it means to lead school improvement. I align here with Holloway and Hedegaard (2023) who specifically attend to the importance of the prefix *re-* rather than *de-* in order to demonstrate the fluidity of constructs like 'professionalism', which are 'always being made and remade as a product of present conditions' (p. 437). I want to problematise these practices that have become normalised; not to consider them as 'good' nor 'bad', as this implies a level of judgement relative to my own view and outside the scope of what is being examined. Such thinking is also aligned with a Deleuzian perspective in that it is 'not becoming *for* some preconceived end, but a becoming for the sake of change itself' (Colebrook, 2002a, p. 14; emphasis original). That is, it is a way of conducting an immanent critique that examines the changing circumstances while also understanding that present ideologies are constructed, not pre-determined.

Digital policy sociology essentially emerged as the theoretical framework for this thesis for a number of reasons. Firstly, the centrality of digital techniques and technologies in the enquiry led to the adoption of this framework. As previously explained in Chapter 2, a key purpose of this thesis is to align with scholars who are intent on reimagining the study of leadership by decentring the embodied leader and instead focusing on the myriad factors that produce leadership conditions (Grice et al., 2023). Centring the platforms as the primary site of analysis is a way to align with this emerging school of thought. Secondly, a digital policy sociology approach enables an exploration of how and why digital data discourses have emerged as a core part of leadership policy and practices. Rather than reductively considering the effectiveness of the policies and practices in question, I seek to explore how and why said practices have come to be in the first place and why it is that they endure. Thirdly, this framework is committed to challenging dominant discourses in order to provide space for thinking differently. That is, digital policy sociology allows for the problematisation of taken-for-granted practices and assumptions within current

forms of leadership in order to create space to think anew. With this in mind, I now turn to an explanation of the overarching research design.

4.3 Research design

In order to facilitate this research, a qualitative case study approach called Comparative Case Study (CCS) (Bartlett & Vavrus, 2017) has been deployed to frame the overall study. CCS offers an interesting and original methodological framework that examines particular cases while simultaneously attending to related global, national and local dimensions (Bartlett & Vavrus, 2017). This more fluid research sensibility means that different cases will necessarily emerge in response to different research questions or theoretical tools, and as discourses and policies are followed during the analysis phrase of the research. As such, the precise nature of these cases is always open to (re)negotiation throughout the research project. When undertaking CCS, cases are compared across three distinct axes, with each serving to contextualise the case in social, political and historical ways (see *Figure 4.2* for an example). These include: 1) the *horizontal axis*, which compares how similar phenomena unfold in like 'places' or 'sites' (e.g., different schools in Melbourne); 2) the *vertical axis*, which looks at how these site-based cases are affected by different policy scales (i.e., local, state, national); and 3) the *transversal axis*, which explores how these cases and phenomena have unfolded over time (Bartlett & Vavrus, 2017). The three axes are all mutually imbricated to ensure a depth of study and to demonstrate the interconnectedness of all social practices.

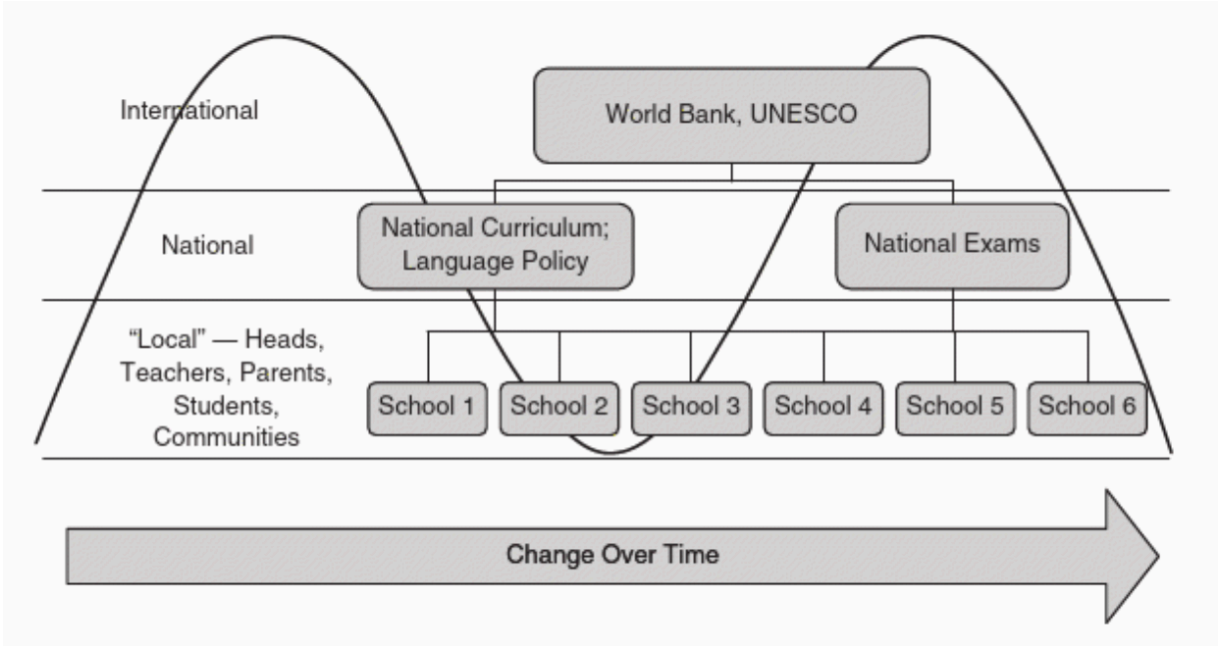

Figure 4.2: A Comparative Case Study Approach to Learner-Centred Pedagogy in Tanzania (Bartlett & Vavrus, 2017, p. 3).

Figure 4.2 demonstrates how learner-centred pedagogy in Tanzania was investigated across the three distinct yet interconnected axes. On the horizontal axis (*sites*), researchers compared the pedagogical practices of six schools in Tanzania. On the vertical axis (*scales*), they looked at how national (i.e., National Curriculum and Exam discourses) and international (i.e., UNESCO and the World Bank) contexts influenced learner-centred pedagogy. Finally, the transversal axis (*time*) examined changes in learner-centred pedagogy over time, and specifically from the period of 1970s to 2013.[12] Comparison not only takes place *between* cases but is also an inherent feature *within* the cases as well.

Drawing on Bartlett and Vavrus (2017), this research project similarly uses CCS to comprehensively examine leadership discourses in Australian schools through the lens of digital data platforms and their associated policies and practices. On the *horizontal axis*, I have determined two Australian-based cases for comparison: 1) *Panorama*, a data platform used within the Victorian State Department of Education and Training; and 2) *Scout*, a data platform used within the New South Wales State Department of Education (which are discussed further in section 4.5). On the *vertical axis*, policy and practices surrounding the datafied logics of platformed infrastructures are examined across a number of different scales, from individual school leaders' experiences to the relevant state and national schooling policy contexts, and then beyond these to more global perspectives (e.g., transnational policies and discourses). Finally, on the *transversal axis*, I attend to temporality in and around the cases to demonstrate not just how they have changed over time according to the experiences of leaders, but to also examine the very conditions of possibility that have developed over time to reflect what is possible in this current moment in leadership. *Figure 4.3* provides a visual representation of this study's overall design.

[12] See *Rethinking Case Study Research: A Comparative Approach* (Bartlett & Vavrus, 2017) for further details of this study.

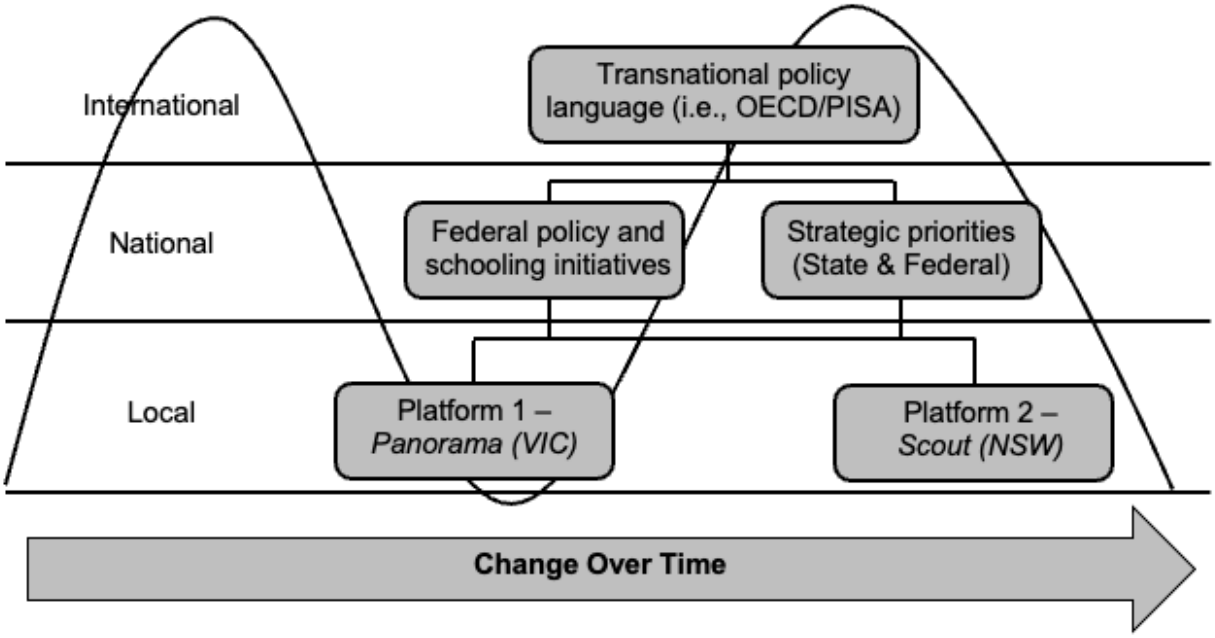

Figure 4.3: A Comparative Case Study approach to examining digital data techniques and technologies in spaces of leadership in Australia.

Additionally, each axis aligns with a specific research question as outlined in Chapter 1 (Section 1.3) to allow depth of study for what is a complex site of analysis (see *Figure 4.4*). I use the vertical axis of CCS to attend to Research Question 1 regarding the logics of datafication and their influence on educational leadership. The transversal axis of CCS is used to explore Research Question 2 involving the impacts of datafied regimes on temporalities, and the horizontal axis attends to Research Question 3 regarding how leadership is being enacted as a result of the datafied regimes. While each axis has been extricated as key focal points, it is important to note that this has been done for explanatory purposes. There is necessarily a lot of overlap between the axes and the research questions.

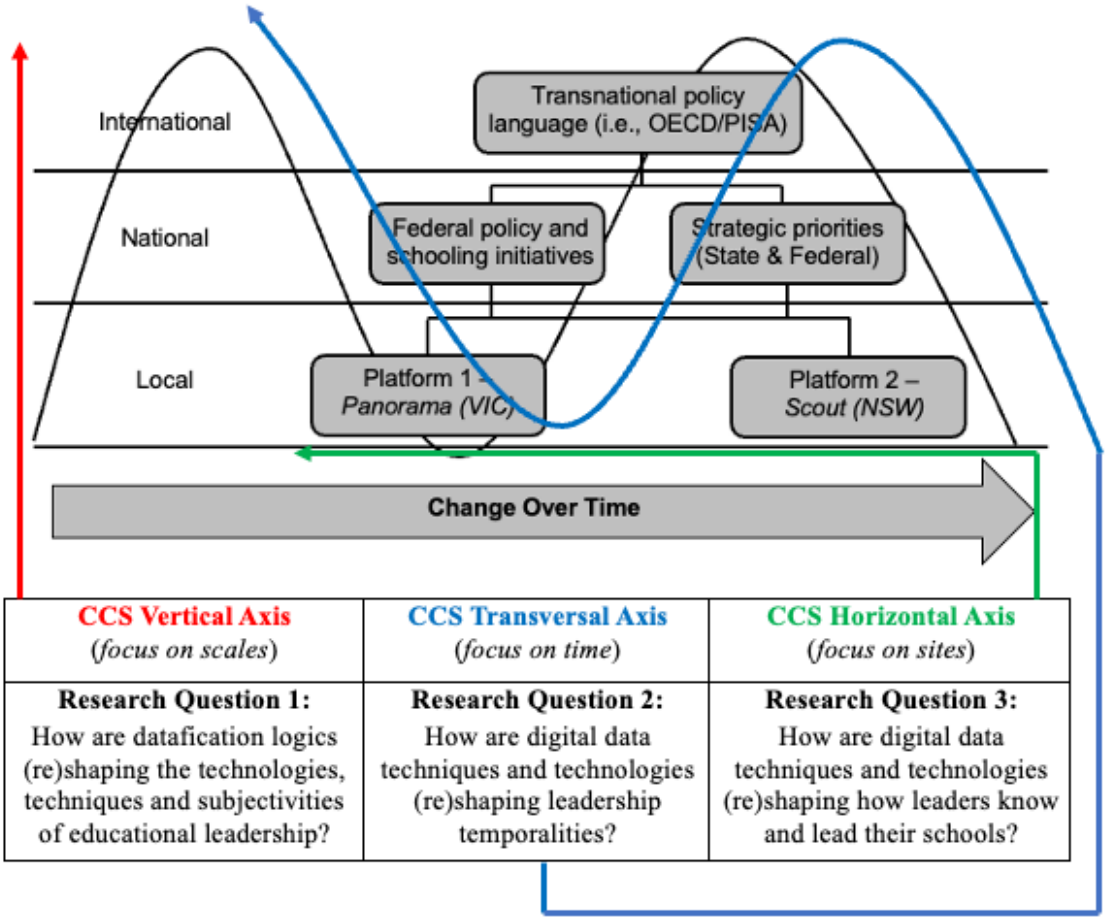

Figure 4.4: A visual demonstration of the alignment between the axes of CCS and the overarching research questions.

Unlike more traditional forms of case studies which are bound by place and activity at the outset (Stake, 1995; Yin, 2009), CCS enables a following of the inquiry, rather than delineating boundaries *a priori*. There is also an acceptance of including non-conventional cases within this approach; rather than conventional homologous places (e.g., schools within a network, classrooms within a school) forming the overarching cases, this specific project generates information around two digital data platforms which thereby share a homologous link due to their corresponding structures. Both Panorama and Scout are arguably not physical places but are rather digital constructions in a particular time-space. CCS acknowledges the need for context to be conceptualised as both spatial and relational (Bartlett & Vavrus, 2017), which also aligns with the poststructural paradigm. The purpose of the CCS approach is to reconceptualise how researchers consider three core concepts in case study research, namely culture, context and comparison (Bartlett & Vavrus, 2017). Importantly, Bartlett and Vavrus (2017) follow the thinking of Maxwell (2013) in practising a comparison that is embedded in processual thinking; one where cultures and contexts are continually (re)made over various spaces. Within this project, it enables the

examination of how leadership practices have emerged, and continue to evolve, in the presence of digital data techniques and technologies.

I began this thesis knowing that I wanted to research leadership differently, though I was really unaware at the outset just how that would look and feel methodologically. Sitting with this uncertainty while also doing the research was, at times, scary in that it did not resemble the more familiar linear research designs that are typically described in the scholarly literature. I became compelled by the thinking of Bartlett and Vavrus and their commitment to comparison as an analytical heuristic to demonstrate '*how much we might achieve through comparison*' (Bartlett & Vavrus, 2017, p. 7; emphasis original). Such thinking really hooked me in, particularly given that empirically I was critically examining comparative performance metrics and how these have come to be valued and used in educational leadership. This forced some significant discomfort; that comparison can aid in discovery yet can also set limitations around what can be discovered. In this sense, the CCS methodology was deeply enabling and moved the locus of the research beyond conventionally bound sites. However, empirically, the purpose of this research is to also critique the normalisation of comparative measures for leaders in school performance discourses. This is a tension that I choose to sit with, rather than attempt to resolve. The following sections provide some additional detail regarding the overall research context prior to a description of the cases.

4.4 Research context

As outlined in previous chapters, discourses of school- and system-level performance have become engrained in global education policy. With international bodies like the OECD and standardised testing programs like PISA providing an impetus for comparing schooling systems around the world, it is not surprising that such discourses have filtered through to Australian shores and schools. What becomes a key requirement alongside such policy practices though are mechanisms of facilitation to ensure that comparisons can be made across the different spatial contexts in which education is enacted. Interoperability *within* and *between* various data (i.e., the exchange of data between different platforms and systems) is critical here in order for 'meaningful' comparisons to be generated.

Such interoperability in the national landscape of Australian education was brought to the fore during the 2007 federal election. Part of the Labor Government's successful election campaign was developing a vision of an 'education revolution' (Savage, 2021b), which would encompass a national approach to fixing the education crisis that had been looming over the country for the better part of a decade. This crisis was based around Australia's education performance relative to other countries based on metricised comparisons, like those found in the

OECD's reports drawing on PISA results.[13] Key to this reform was the development of a national agenda for Australian education, which would see all States and Territories continuing to govern their relative schooling systems, but with an unprecedented overarching federal presence. In order to do this, the Australian Curriculum, Assessment and Reporting Authority (ACARA) was established in 2008 as the independent statutory authority for actualising these national priorities. Three of ACARA's fundamental priorities have been the formation of a national curriculum (referred to as the Australian Curriculum), the further development of a national assessment program (NAPLAN) and the establishment of public comparison mechanisms through the website *My School*.[14] This website provides a range of 'nationally consistent' data about schools, including NAPLAN results, attendance figures and financial profiles, with the intent of increased accountability and transparency for parents/carers and the broader community (ACARA, 2025). ACARA also publishes the annual *National Report on Schooling in Australia* on the collective behalf of Australian state/territory ministers for education, where student outcomes relative to the *Measurement Framework for Schooling in Australia* are detailed.

While further information on these reports will be provided in Chapter 5, it is important to understand their overarching relevance to the cases identified in this study. ACARA's key mechanisms for national education reform have led to the proliferation of heavily metricised performance discourses being embedded into the schooling vernacular. Similarly, there has been much public scrutiny of My School and the implications that it has for individual schools and for education systems more broadly (see, for example, Gannon, 2013; Gorur, 2013; Mockler, 2013). Such critique is of great importance, but for this thesis, the significance is placed upon the website as a central mechanism for national reporting about individual school performance and the implications this has had on state departments of education. This includes the development of state-level digital infrastructures to respond to the call for particular types of data for national

[13] The 2007 report by the Council for the Australian Federation (CAF), titled *The Future of Schooling in Australia* (CAF, 2007) is a key example of how the OECD's PISA rhetoric was being used to project current forms of Australian schooling as problematic and in need of reparation through a federal approach. While the OECD/PISA results drawn on in this report are far from damning, and actually articulate these findings as 'good rankings' (p. 9), the need for continuous improvement in the international education competition is overtly stated, with the mechanism for doing so being centred on national reforms.

[14] The *My School* website contains data on every school in Australia (both government and non-government). It provides general information, such as NAPLAN performance, funding, enrolments, attendance rates, etc., to parents/carers and the broader community in line with national priorities around transparency and accountability.

cross-comparison, and specifically, digital data platforms that can enable this. I turn to a discussion of two such cases now.

4.5 Cases of platformed infrastructures

Two cases, *Panorama* and *Scout*, have been selected to focus on within this project to investigate the overarching research questions. Each of these platforms are what Kerssens and van Dijck (2021) would categorise as learning management and support systems (LMS), data platforms that operate in a largely administrative capacity to record of a host of datafied information about schools and their performances relative to other government schools in the state. While further details are provided in the following sections on these platforms, I wish to offer a point of clarification about the language and terminology used throughout the remainder of this thesis in relation to these two cases. In the writing that follows, I refer to each case at times by their individual platform name (Panorama, Scout) when I am simply discussing *concrete* aspects of the platform (e.g., displays, figures, tech requirements, etc). Most other times, I use the term *platformed infrastructure* to more fulsomely describe the complex array of multidisciplinary engagement needed for an inquiry such as this. Here, I align with scholars Perrotta and Pangrazio (2023) in their discussion of the rise in the platformisation of education, which has contributed to the rise of platforms-as-infrastructures in educational contexts. As discussed in Chapter 2 (section 2.8), platformed infrastructure as a term captures the very 'logics of platformisation and infrastructuring' (Perrotta & Pangrazio, 2023, p. 6), rather than viewing digital platforms as discrete LMSs that somewhat overlay themselves on an established education system. Instead, it encourages a more sociological view of the datafication of education in terms of how encounters between governance logics, like those found in systems of schooling, and the rise of sociotechnical products and processes have come to be mutually imbricated.

I clarify this before progressing further with the added caveat that it has only been towards the end of these doctoral studies that I have arrived at this agreed terminology. It has been far from a straightforward process to get to this point, and I have used many terms throughout my doctoral journey to refer to the two overarching cases in question; platforms, infrastructures, data infrastructures, assemblages, platform assemblages, and so on. There are excellent bodies of research that also refer to similar phenomenon through more widely accepted terms, particularly those pertaining to critical platform studies and data infrastructures. However, my decision to refer to the two cases identified here in this thesis is largely to do with perspective; I have honed in on the platforms as a core focal point but have also attended to the various other elements of the broader infrastructure connecting the platforms with policies and practices. Put differently, I see

the focus of platformed infrastructures as pertinent to the logics of platformisation present in datafied infrastructures. Such a viewpoint aligns with CCS as the cases have emerged and remained open to (re)negotiation throughout the duration of the project.

That said, the following two cases were selected because of their common elements in terms of policy and practices. Panorama had been the core focus in my previous Master's thesis research (see Langman, 2021) which, at the time, demonstrated a warrant for further research to be conducted. I undertook initial Internet searches on various State Department of Education websites, which I knew from professional experience housed a breadth of information about systemic policy and associated practices. During these searches, it became apparent that Panorama and Scout were comparable in the sense that they were both state-government-level data platforms that housed similar types of school 'performance' data and were also connected to broader state-level education policies to do with leading school improvement. What developed from these initial searches was an awakening to a 'formation of thought that *emerges* through repetition' (Jackson & Mazzei, 2012, p. 8) of discourses in policy documentation. Consequently, New South Wales and Victoria are the first- and second-largest providers of public education within Australia, respectively (ACARA, 2025). While the intention of this thesis is not to generalise the experiences of leadership within these states, it does add an interesting element to consider how the policy landscape of the largest public education providing states is structured.

Initially, I had intended to focus on a third case, one focused on a platform-less system in the Australian Capital Territory (ACT) (also the smallest public education provider within Australia). This is an interesting setting given its geographical location within the state of New South Wales, and the capacity for overlap with the NSW Education Department. For example, the Scout platform and associated materials are *available* to school leaders in the ACT by the NSW Education Department; however, their use is not *mandated* by the ACT Education Directorate, nor is it specifically embedded into accompanying policies and practices. However, during the data generation around the two cases of Panorama and Scout, the scope for a third case became somewhat limited given the breadth of materials that had already been discovered and used to build a comprehensive picture of the first two cases. Put simply, I was running the risk of sacrificing depth of case analysis for the sake of breadth if I continued to pursue the third case. This still remains a possible site for future enquiry but presently sits beyond the scope of this thesis. In the following sections, I provide an outline of the two overarching cases.

4.5.1 Case One: Panorama

Panorama is a digital data platform used by the Victorian Department of Education and Training (DET) for understanding and comparing the performance of Victorian government schools and networks. Panorama is provided as an accessible digital data platform for principals and school leaders and contains quantitative data of a pre-selected range of data sets, including achievement, attendance and opinion survey data (DET, 2024g). The platform operates under a comparative framework, structuring the data using algorithms to compare a school's performance to 'similar' schools, as well as offering network- and state-level comparisons (see *Figure 4.4*). The interactive dashboards are complemented by two static reports that schools receive annually: the School Performance Report, which 'provides a summary of the school's overall performance and performance in each domain' (DET, 2023d, p. 84) of reading, numeracy, school climate, attitudes to school, engagement and participation; and the Panorama Supplementary Report, which 'is designed to demonstrate how the school is performing against the four main Education State targets' (DET, 2023d, p. 91). In the latter, comparisons are made with both 'similar schools' and state averages by drawing on a pre-developed formula known as the Differentiated Schools Performance Method (DSPM).

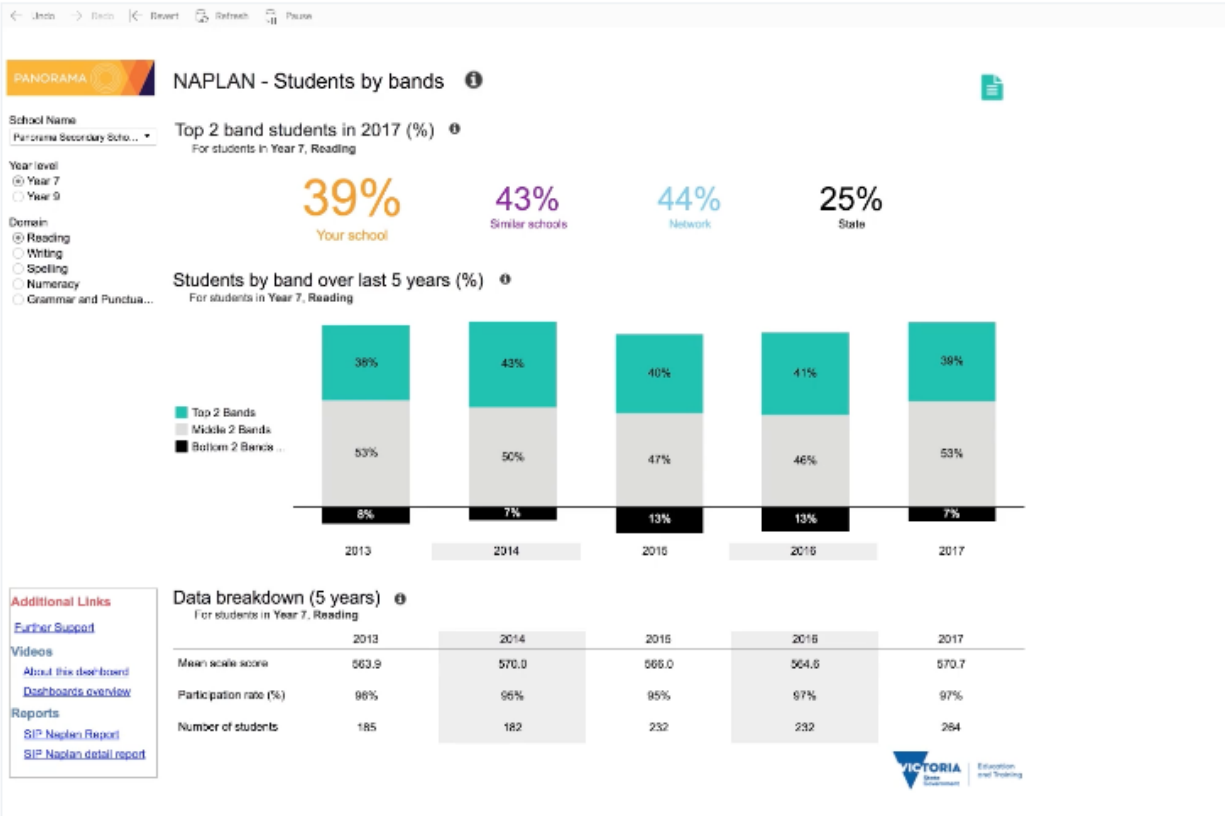

Figure 4.4: A visual captured in a publicly available training video of a webpage from *Panorama's* online dashboard (DET, 2017b).

4.5.2 Case Two: Scout

Similarly, the New South Wales Department of Education's (DoE) Scout offers a range of school performance information, hosting achievement, attendance and opinion survey data. Scout is overtly described as the NSW 'Department of Education's platform for data and analysis' (DoE, n.d.-b, n.p.). Like Panorama, Scout also provides schools with copious data in a single location, formulaically aggregating data sets for access by teachers, principals, school leaders, directors and corporate staff members. Scout draws on data sets internal to the Department of Education (i.e., those obtained by schools), as well as external data sets from government departments and national education bodies (DoE, 2024d). Positioned as a 'one stop shop for data analysis' (DoE, 2023e, n.p.), Scout hosts a library of over thirty different apps and report types for schools and associated personnel to access and use in school decision-making and governance (DoE, 2023a). One prominent component is the school data dashboard (DoE, 2023d), which is a specific focus of my analysis due to its strong comparability to Panorama (see *Figure 4.5*).

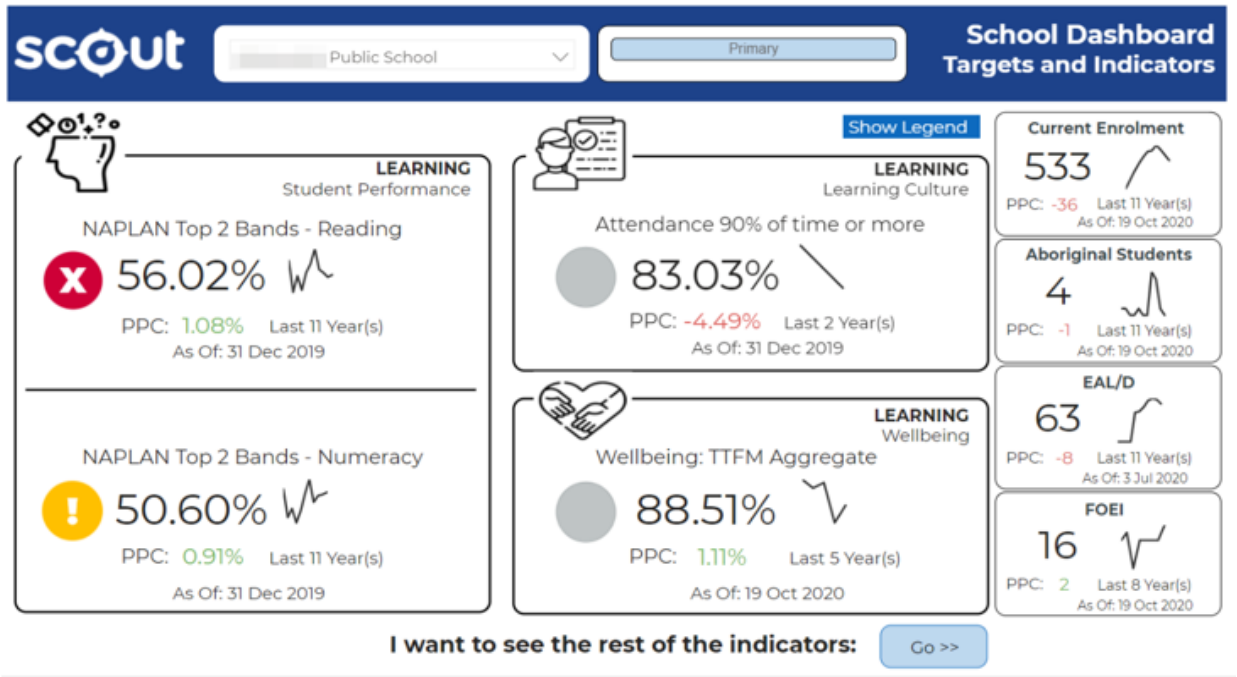

Figure 4.5: A static visual of a webpage from Scout's online dashboard (DoE, 2023d).

4.6 Case data generation

As mentioned at the opening of this chapter, I commenced this project knowing that I wanted to challenge the more conventional methods for studying leadership (via in-depth interviews) to contribute to the emerging body of research that decentres the leader in analyses of leadership (Grice et al., 2023). I achieved this by developing a research design that specifically centred the

research around the digital data platforms (outlined in the previous section) to explore how school leaders are able to think about and lead their schools in light of digital data technologies. However, I remained cognisant of the enduring value that interviews could offer an in-depth qualitative study such as this. I was also aware from my previous research that there would be accessibility issues due to the sensitive nature of data platforms in obtaining access to 'walkthrough' the actual data platforms. So, much like van Gogh painting *Starry Night* without being able to physically see the night sky, I needed to consider how to analyse Panorama and Scout without doing platform walkthroughs.

So, I continued with extensive Internet searches beginning with the two relevant State Education Department websites (see *Table 4.1*). Using the keywords 'Scout' and 'Panorama' in the relevant Department website's search functions as a starting point, I located a number of electronic documents relevant to the platforms. I also scoured each Department's policy library for mentions of either 'Panorama' (VIC) or 'Scout' (NSW) and used a 'follow the policy' approach (Peck & Theodore, 2012) to trace their broader networks and establish any fundamental connections with websites external to the initial Department websites. What emerged throughout the data generation phase were four prominent 'sites' of information relevant to the inquiry: 1) platforms, 2) policy documents, 3) policy artefacts and 4) principals[15] (see *Table 4.2*). The first three sites were groups of digital documentation, while the fourth and final site was interviews with school leaders who were using the technologies (these are elaborated on in the following section). Overall, these core methods of document analysis and in-depth interviews are aligned with a poststructural disposition as they enable one to examine how things are being said (through both text and spoken word).

Victoria	**New South Wales**
Department website:	*Department website:*
https://www.vic.gov.au/education	https://education.nsw.gov.au
Policy and Advisory Library:	*Policy Library:*
https://www2.education.vic.gov.au/pal	https://education.nsw.gov.au/policy-library

Table 4.1: Key Department Websites.

[15] I use the term 'principals' here intentionally in lieu of the more generic term 'leaders' as all of the participants that I interviewed held the position of principal in their schools.

Data Site 1: ***Platforms***	**Data Site 2:** ***Policy Documents***	**Data Site 3:** ***Policy Artefacts***	**Data Site 4:** ***Principals***
The graphical user interfaces (GUIs) and the application programming interfaces (APIs) of Panorama and Scout, examined through relevant Department training and policy materials.	Policy documents relevant to Panorama and Scout through shared language and/or data use and practices.	Documents gathered from school websites, including SIPs/SSPs, AIPs, Annual Reports and Panorama Performance Reports.	Users of the technologies, namely Principals working within schools (n = 7).

Table 4.2: The overall data corpus.

4.6.1 Document analysis

The term 'documents' is used here and throughout the thesis as a universal term to refer to the array of text-based sources used in the subsequent analysis. This term is inclusive of texts in various forms rather than just traditional word-based scripted entries, including videos, webpages and visuals, as well as in a number of differing formats (digital, paper, cloud-based). Following Mockler and Stacey's (2024) discussion of what counts as a policy text, I align with their 'broad church' (p. 21) approach for considering a wide range of documentations produced under conditions that outline an 'authoritative allocation of values' (Easton, 1953, p. 129), while being able to justify their constitution as a policy text. As such, I have categorised the 'documents' that have come to form the data corpus into three distinct, yet related, groupings based on their 'site' of analysis: platforms, policy documents and policy artefacts.

Data Site 1, *Platforms*, is inclusive of the materials that directly related to and explained the digital data platforms being investigated. Inclusion criteria were specifically directed to the platform as the site of analysis; I wanted to gain an understanding of the functionality of Panorama and Scout in terms of what they visually looked like (namely, their GUIs), the types of data they housed and how this was displayed, who could access the platforms and how, and so on. Much of this 'documentation' was gathered from the relevant State Department of Education websites as outlined in the previous section. I used the search function on each Department's website to initiate searches, and found an eclectic array of webpages, video explainers, how-to and FAQ guides, etc. largely available for principals and other leaders to use as training materials for the platform's implementation in their own context. I also conducted Internet searches using the Google search

engine, again with the key terms ‘Panorama’ and ‘Scout’ (but added ‘Department of Education’ to each), which yielded a small number of results external to those found on the Department websites and consequently led to the development of Data Site 3.

Similarly, Data Site 2, *Policy Documents*, were primarily collected and collated from the relevant State Department of Education websites. Each Department website houses their own public repository of operational policies within the department. Government schools can adopt these policies verbatim in their own specific contexts, or they can use them as a basis for developing a more personalised policy for their school’s context. School-based staff are the intended audiences for these repositories (DET, 2024a), however they are also a matter of public record for other key stakeholders (e.g., parents, allied health services). Again, I used the supplied search function to initiate searches for policy documents pertaining to Panorama and Scout and then adopted a ‘follow the policy’ (Peck & Theodore, 2012) to locate other connected policies.

The development of Data Site 3, *Policy Artefacts*, was in response to the need for a third tentative category to classify the various documentation that had emerged during Site 1 and Site 2 searches. The policy artefacts have been categorised as such due to their explicit relation to the platformed infrastructures; that is, they are a *direct product* of the platforms and associated policies. These were obtained from individual school websites from each respective state after Google-based searches during Site 1 exploration revealed the presence of supplementary reports (i.e., Panorama Performance Reports). Similarly, policy documents gathered at Site 2 also pointed towards school websites as sources of information regarding school performance (e.g., school-level strategic plans, annual reports). In this way, school websites as ‘sites of promotion’ (Saltmarsh, 2024) also contained information that could be included in the data corpus. As such, I used ChatGPT to randomly generate two lists of government schools (one for Victoria – $n = 150$, and one for New South Wales – $n = 220$) for inclusion, which comprised a sample of roughly ten percent of all government schools in each respective state.[16] I listed these schools in an Excel spreadsheet and, after visiting each school’s website, made a note of which artefacts were available on which website and produced analytic memos during my web scavenging for later reference. I exported PDF copies of the most recent versions of all available document type from each

[16] While I am aware of the limitations of such a rudimentary ChatGPT search here, the purpose was to generate a quick list of schools in each state to check their websites for specific policy artefacts. The intention was not to create a perfect sample that included a balanced percentage of school types (e.g., primary, secondary, combined) that reflected the broader state composition, but rather a simple scoping sample to determine the presence of such documents. Schools were accurately verified as government schools via their websites.

website[17] (e.g., strategic plans, annual plans, annual reports and any other relevant documentation, including Panorama Performance Reports and examples of more historical strategic/reporting documents) and collated these in digital files for later analysis.

One key challenge throughout the time of data collection from Sites 1, 2 and 3 over a three-year period was the continually evolving nature of the Department websites and the documents therein. For example, as policies were updated on the website, previous versions were generally deleted and replaced with the new ones. This made it difficult at times to revisit saved websites and caused concern about the validity of data and referencing sources correctly and appropriately. Where possible, I exported webpages as PDF documents and saved these to ensure that the documents that I was referring to in my analysis were the same as those that I had collected. Additionally, there were also training demonstration videos that could not be simply downloaded from the Department websites. For these, I transcribed the videos into Word documents and took screenshots of various visual stills to include within the transcripts.

4.6.2 Semi-structured interviews

In order to account for the lived-experience dimension of this research, Site 4 required my seeking out participants who were currently working in leadership positions within government schools in either New South Wales or Victoria to participate in an online semi-structured interview via Zoom. Given the qualitative research design, I had hoped to secure a small number of participants to add to the existing data corpus (final count $n = 7$). I developed a social media advertisement outlining the basic parameters of the research and participant requirements (see *Appendix 1*), which was initially shared by the Twitter/X account of the Institute for Learning Sciences and Teacher Education (ILSTE), the university's research institute in which I have been undertaking my doctoral studies. This advertisement could then be reshared by other users and across various social media platforms (Instagram, LinkedIn, etc.). Interested participants contacted me via email where I supplied them with further information about the project, including the Participant Information Letter (see *Appendix 2*). This also gave me a chance to vet participants to ensure that they were currently working in a position of leadership within a government school in either NSW or Victoria. A copy of the interview protocol (see *Appendix 3*) was also provided to give participants a chance to have a think about our upcoming discussion prior to the event. While I

[17] Some school websites stored multiple versions of each document type (e.g., Annual Reports dating back over the years). In these cases, I exported the most recent version of the document for analysis, except in a couple of instances where I found and saved early reports and plans from a decade prior to consider the development of these forms of documents over time as part of the transversal component of CCS.

did clearly state that participants were free to deviate from the questions listed within the protocol, I felt it was important for participants to get a sense of what I would like to know more about prior to conducting the interview. I remain very conscious of how precious time is for those who work in leadership given my own prior experiences in the field, and so I wanted to ensure that we could maximise our time together.[18]

All interviews were conducted between January and July 2024 based around participant availability. These interviews, which were generally 40 to 60 minutes in duration, were conducted online via Zoom and were recorded with the consent of participants. During each interview, I handwrote key statements in a notebook from participants as well as notes on potential themes and codes to refer back to at the conclusion of the interview. I limited this to only salient points that I wanted to recall so that I could maintain active participation in the conversation through regular eye contact and reassuring facial and hand gestures. After each interview, I noted any additional reflections in the form of analytic memos (Saldaña, 2016) alongside the other notes. I produced digital verbatim transcriptions of each interview where I assigned each participant with a generic pseudonym to ensure anonymity of the data moving forward (see *Table 4.3*).

Pseudonym	**State**	**School Type**[19]
Principal A	New South Wales	Secondary
Principal B	Victoria	Secondary
Principal C	Victoria	Combined
Principal D	New South Wales	Primary
Principal E	Victoria	Combined
Principal F	Victoria	Primary
Principal G	Victoria	Primary

Table 4.3: Participants

[18] I would like to highlight the tension I felt here as a researcher intruding on the limited time of others, particularly those working in education. I felt a strong sense of guilt for taking up the valuable time (personal or professional) of these participants right from the outset. Unpaid labour, particularly in education, is a very real phenomenon, and I would like to acknowledge this very point, particularly considering the ethical issues around offering financial incentives to participate in research. Again, this is another tension that I sit with, and I also used to inform my research design, to develop a study that is not reliant on interviews alone. With all of that said, I would like to thank my participants for being incredibly generous and gracious with their time and for doing so without any semblance of complaint

[19] School Type refers to the school's enrolments and have been categorised as Primary (Year Prep/equivalent – Year 6), Secondary (Year 7 – Year 12) or Combined (Year Prep/equivalent – Year 12, often called P-12 settings).

4.7 Data analysis

'Thinking with theory' (Jackson & Mazzei, 2012) has been the key analytical approach throughout this project. However, true to a poststructural perspective, it does not come with a specific formula for its enactment. Rather, 'thinking with theory' outlines a rigorous analytical process in which qualitative data are 'plugged in' to different concepts in order to generate interpretations. Such an approach is also converse, in that while theory aids in data analysis, theory can also inform the collection of data as well. Building on the assertion of St. Pierre (2011) that data does not have a fixed identity that is just 'waiting to be analysed' (p. 621), Jackson and Mazzei (2012) discuss how they use the concepts of various philosophers to 'activate a circuit to see what sparks, jolts, and puts thought in motion' (p. 3). It is the very act of 'thinking with' that generates the data. In this way, there is a level of (very) messy experimentation involved whereby repetition is enacted to develop new lines of thinking (Jackson & Mazzei, 2012). Perhaps the feelings of 'messiness' speaks to the anti-methodological thinking of such an approach and its resistance to conforming with conventional methods of analysis.

In order to 'think with theory' in this thesis, I drew on a range of concepts by philosophers outlined in Chapter 3 (section 3.4). Specifically, I have drawn on concepts previously developed in the context of datafication studies, including *recessivity* (Hong, 2020), *data hygiene* (Mulvin, 2021) and *metric fixation* (Muller, 2018). Following Hong (2020), I draw on Wittgenstein's (1969) *groundless grounds* in relation to recessivity to explore this connection specifically in relation to education. Similarly, I bring together *temporal horizons* (Luhmann, 1976) with data hygiene (Mulvin, 2021) within the context of digital policy sociology. I established alignment with the three 'thinking with' dispositions and the three axes of the CCS methodology, and subsequently extricated these into their own specific chapters (see *Table 4.4*). Again, this was an iterative process that occurred throughout the research journey rather than something established from the outset. I also wish to stress again that the establishment of these somewhat categorical structures is largely for illustrative purposes; there is necessarily much overlap between the research questions, the axes, the theorical concepts and the analysis chapters.

Research Question 1:	**Research Question 2:**	**Research Question 3:**
How are datafication logics (re)shaping the technologies, techniques and subjectivities of educational leadership?	*How are digital data techniques and technologies (re)shaping leadership temporalities?*	*How are digital data techniques and technologies (re)shaping how leaders know and lead their schools?*

CCS Vertical Axis (focus on *scales*)	CCS Transversal Axis (focus on *time*)	CCS Horizontal Axis (focus on *sites*)
Theoretical focus: ‘Thinking with’ *groundless grounds* and *recessivity*	**Theoretical focus:** ‘Thinking with’ *temporal horizons* and *data hygiene*	**Theoretical focus:** ‘Thinking with’ *metric fixation*
Attending chapter: Chapter *5*	**Attending chapter:** Chapter *6*	**Attending chapter:** Chapter *7*

Table 4.4: A representation of the alignment between the research questions, the axes of CCS and the theoretical foci.

The conceptual toolbox emerged from my methodological journeying through scholarly texts. As I engaged in philosophical reading that was new to me, I found myself inadvertently making sense of what I was reading (or trying to) in the context of my research. I was ‘plugging in’ my data to philosophical concepts and vice versa without realising it to generate ways of considering my overarching research questions. There is an alignment here with the thinking of Foucault (1974) who stated that he wished for his books to be seen as ‘a kind of tool-box which others can rummage through to find a tool which they can use however they wish in their own area’ (pp. 523-524). As discussed in the previous chapter, ‘thinking with theory’ has enabled me to gather my own toolbox of philosophical concepts and intellectual thought in which I rummage around and experiment with to find my own subjective ‘right-fit’.

Such an approach might seem problematic for some scholars, which is why I am up front about my own reflexive entanglement in this research. This study is framed by the notion that nobody enters into research in a neutral capacity (D’Ignazio & Klein, 2020) and every decision made has implications for subjective tensions to occur. This research clearly ascribes to poststructural tenets, whereby research is never unbiased. Foucault (cited in O’Toole & Beckett, 2013, p. 20) asserts that ‘everything is dangerous, nothing is innocent’, in terms of the way that we (as researchers) naturally reflect our own value judgements and ideologies. This was reflected at the outset of this thesis in the Prologue, and I wish to reiterate it here again. Once more, I draw on scholars such as O’Toole and Beckett (2013) who express that researcher subjectivity is not something to be feared nor denied during the research process. Demonstrating an awareness of it, chronicling and comparing it in terms of what it says more widely about reliability, credibility and triangulation all aid to ensure reflexivity is serving the interests of both the research and the researcher. My own experiences working in schools, having friends working in and for schools and having children in schools, all shape my thinking. I make no apologies for this, as such contamination is what ultimately produces the individuality within this thesis. However, it has

made the upholding of strict ethical standards all the more important (as outlined in the following section), so I avoid tarnishing the integrity of the research produced.

Additionally, this analytic process has called for a reconfiguring of more conventional coding processes, particularly to reconcile Jackson and Mazzei's (2012) assertion for the need to shift the dogmas of conventional qualitative research. Over several cycles, I read (and reread) documents, including the interview transcripts alongside theory to generate the analysis outlined in the following chapters. In this way, I viewed coding as a heuristic (Saldaña, 2016) in which I used it to help locate patterns and repetitions within and beyond the data corpus. At times, my codes were simply a thematic word or phrase (e.g., performance, perverse pressures of accountability) and at other times they signalled a particular theory or concept (e.g., assemblage, discourse, groundless ground).

Mostly, however, my codes turned into extensive pieces of writing more akin to analytic memoing (Saldaña, 2016) based on my encounters between data and theory. Analytic memoing involved reading through the collected documents (and oftentimes, searching for other documents relative to a particular line of inquiry) and interview transcripts and making notes about the encounters. Bartlett and Vavrus (2017) also recommend the use of memoing as a strategy specific to the transversal element of the CCS approach in order to build an understanding of the more temporal dimensions of the cases being studied. I maintained a digital journal of notes in Microsoft Word as an 'intellectual workplace' (Thornberg & Charmaz, 2014, p. 163) for myself as researcher that I then subsequently revisited to compile my analysis. I also digitally annotated documents and interviews throughout the multiple read-throughs, which ultimately became mini conversations with myself about the data (Clarke, 2005). This was also an interesting exercise and demonstrated the need for multiple cycles of coding as the focus depended on the theory that was being 'plugged in' at the time of writing. It also reinstated the generative nature of a 'thinking with theory' approach in that I was developing multiple analyses of the same data through the plugging in of different concepts.

4.8 Ethical considerations

The purpose of this section is to outline the ethical considerations that have framed this study. I do this by referencing the specific professional University ethical standards and expectations that underpin this study, but to also outline some of the more personal elements from my own ethical standpoint. For this research to be viewed in a manner that upholds integrity, it has been a fundamental consideration that strong ethical principles are adhered to throughout the research process it its entirety (O'Toole & Beckett, 2013). Prior to commencing participant recruitment, I

gained ethical approval from Australian Catholic University's Human Research Ethics Committee (ACU HREC) (see *Appendix 4*). The project was categorised as 'low risk' with the only foreseeable risk being no greater than discomfort (NHMRC, 2023, section 2.1).

The primary ethical concerns associated with this research were around anonymity, systemic accessibility and pre-existing relationships. Firstly, all efforts were made to ensure participant anonymity, including the de-identification of transcripts and the removal of any contextual details that may inadvertently identify them (school names, manager names, enrolment figures, etc). As outlined in this chapter (section 4.6.2), all participants were assigned a generic pseudonym alongside minimal contextual details (state location and school type). Part of obtaining informed consent was to advise participants of the existing but minimal risk of identification in spite of all efforts to ensure anonymity as evidenced in the Participant Information Letter, consent form and during the interviews. Similarly, even though the rest of the data corpus aside from the interviews was all publicly available information, I have still de-identified any documentation referred to in this thesis and any other public facing outputs (papers or presentations). All recordings and documentation within the data corpus have been securely stored on the password protected ACU OneDrive as per recommended practice in ACU's Research data management toolkit (Australian Catholic University, n.d.).

Secondly, systemic accessibility was identified in the early stages of the research design as a potential concern. Each State/Territory Education Department have their own regulations about conducting research in Australian schools. In the context of this project, this meant ensuring that the research I was hoping to conduct was in line with the requirements of the NSW State Education Research Applications Process (SERAP) and the Victorian Research in Schools and Early Childhood Settings (RISEC). Consultations via email were conducted with the relevant research divisions in each State Department of Education to establish how contact could be made with school leaders. During these email conversations, it was established that a SERAP and RISEC application in addition to university ethics approval would not be required if interviews were not conducted on site and if participants were not directly emailed as a recruitment strategy.[20]

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[20] Information correct for this specific project at the time of the email exchanges, which was between August and November 2022. I would like to mention that I received conflicting advice in 2023 from SERAP (NSW) for a different research project separate to this enquiry, which stated that a SERAP application would be required for any research conducted on any Department employees, including principals and other school leaders. In any case, I believe that I have acted ethically and within the permitted guidelines, considering that I conducted the interviews online rather than onsite, maintained the focus of the interview on the experiences of leadership and not specifically to any school

The third main concern was about navigating power dynamics between the researcher and participants. Participants were required to contact me to express an interest in participating in the research project, thus minimising the chance for researcher coercion. Upon this initial contact, participants were provided with a digital copy of the Participant Information Letter and consent form and were invited to ask any clarifying questions they may have had about the project. Online interviews were only scheduled once the signed consent had been received, and all participants were provided with a de-identified copy of their interview transcript to redact any and or all content of their choosing. Prior to and during all interviews, I was upfront about my previous experiences working in education in both teaching and leadership positions. I did this as a way of establishing a rapport with principals and to demonstrate that I was familiar with the daily workings of schools to maximise the chance for the interviews to be conversational and relaxed in nature. I did have prior professional relationships with some of the participants I interviewed. For these, I made sure that participants were very aware that there was no pressure to participate and that their decision (to participate or not) would not impact our professional relationship whatsoever. The comprehensive consent process allowed numerous opportunities for participants to withdraw consent without reprisal. I was also critically reflexive throughout the interviews and subsequent analysis as to how these relationships were influencing the research process and had regular discussions with my supervisory team to mitigate any ongoing ethical concerns.

Personally, I was also still an ongoing employee of the Victorian Department of Education for the majority of my doctoral studies, until my official resignation in June 2024. Despite being on approved leave from my substantive school position to pursue my doctoral studies, I still maintained access to Department information through existing login details. This meant that I had the capacity to access information behind firewalls that is intended for Department employees only and not members of the general public. The importance of upholding an ethical standard was

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site and recruited participants via social media rather than through direct contact with schools. I would also like to note the problematic nature of being discouraged from contacting schools directly via their generic emails, given that school email accounts receive emails from a wide range of businesses and community organisations to which they have the choice to engage with or simply ignore.

Similarly, I think it is important to acknowledge the strain of policy constraints in the personal and professional agency of those working in leadership positions in state government-run schools. Principals are entrusted to run schools in accordance with what they deem to be appropriate for their specific context and should therefore be trusted to engage with university approved research projects relative to their specific learning context. Principals and other school leaders should also feel free to respond to such calls in their personal time without fear of reprisal, which is an important conversation to continue but beyond the scope of this thesis.

paramount here to ensure that I acted with integrity and the utmost respect for my employer but also for upholding the standard of my research. As such, only genuinely public data was sourced and included in the overall corpus. I did this by never inputting my employee credentials when conducting searches (stopping and returning when I reached a log-in point) and also providing websites to my supervisory team, who did not have access credentials, to double check availability when unsure.

4.9 Conclusion

The purpose of this chapter has been to outline the methodological considerations given to this project. I have explained the core qualitative research design which is animated through the poststructurally aligned lens of digital policy sociology and enacted through the CCS methodology. While I discourage this chapter from being used as a 'how-to' guide, as this fundamentally jars with the poststructuralist paradigm, I would encourage readers to take away what is necessary in order to conduct their own future enquiries. Fundamentally, I hope that this chapter provides the necessary impetus and ideas for doing things differently and overcoming some of the potential barriers one might face when conducting similar research. In this way, I hope that this chapter can be seen as a Deleuzian-Guattarian 'line of flight' from more conventional studies of leadership, demonstrating the productive possibilities of minoritarian thinking. Put simply, I want to demonstrate that there are other ways to design research to examine both new and enduring problems, much like van Gogh did by painting *Starry Night* without access to the physical night sky.

What follows next are three analysis chapters that put this methodological design to work to address the research questions outlined in Chapter 1. Here, I very much liken the process to that described by Charmez (2014), in which she sees coding as developing the bones of the analysis with the subsequent intention to 'assemble those bones into a working skeleton' (p. 113), or more simply, a functional and coherent analysis. Firstly, I use Chapter 5 alongside the vertical axis of the CCS design to respond to the first research question regarding how datafication logics are (re)shaping the possibilities for educational leadership. In Chapter 6, I address the second research question via the transversal axis to attend to the temporal dimensions of leadership and in Chapter 7, I attend to the horizontal axis to examine the third research question regarding how the platformed infrastructures are (re)shaping how leaders know and lead their schools. Throughout these chapters, I demonstrate the generative prowess of 'thinking with theory' (Jackson & Mazzei, 2012) and how it has enabled a way of considering the platformed infrastructure of the two selected cases and their impacts on how educational leadership can and is enacted.

Chapter 5: Foundational[21]

Figure 5.1: *The Treachery of Images* (1929) painting by René Magritte.

From *Sartle*, retrieved from https://www.sartle.com/artwork/the-treachery-of-images-rene-magritte. 2012 – 2025 Sartle.

Also known as This is Not a Pipe (Ceci n'est pas une pipe), this *painting by surrealist artist René Magritte influenced Foucault greatly, with him attributing his thoughts in the form of a book.*

5.1 Introduction

Informed by the preceding chapters that outlined the theoretical and methodological underpinnings of this thesis, this chapter now turns to the first of three analysis chapters that address the overarching focus for this research: *How, and to what extent, are digital data discourses reconfiguring the conditions for school leadership*? Within each of these three analysis chapters, I emphasise the productive nature of the platformed infrastructures operating in the Victorian and New South Wales public schooling contexts in terms of how they produce three central conditions in which educational leaders enact their work. These are, in turn, the 1) *foundational* conditions, 2) *temporal* conditions and 3) *relational* conditions. Although each

[21] Parts of this chapter have been previously published in the paper, Langman, S. (2024). Deferred expertise: The groundless ground of datafication and the shift to recessive technologies. *Educational Philosophy and Theory*. https://doi.org/10.1080/00131857.2024.2411336

chapter will address just one of these key conditions, their relationality towards one another will be highlighted throughout the analysis and in the subsequent discussion in Chapter 8.

In this first analysis chapter, I argue that the platformed infrastructures around Panorama (in Victoria) and Scout (in New South Wales) produce (and are themselves produced by) key foundations for how leadership can be enacted in educational settings (i.e., schools, networks, departments). Specifically, I seek to address the first of my three research questions: *How are datafication logics (re)shaping the technologies, techniques and subjectivities of school leaders?* Key to this chapter are discussions of school performance which are important considerations in the context of the platformed infrastructures; school performance discourses heavily permeate the logics underpinning both the platforms and policies associated with Panorama and Scout, thus influencing the work undertaken by leaders working in schools.

The Treachery of Images (see *Figure 5.1*), by surrealist artist René Magritte, offers a provocation for considering the overall instability of meaning, which we can apply more broadly to discourses around school performance. Foucault (2008) used this image to demonstrate the way that discourses can mislead us by acting as direct reflections of reality rather than as representations. Whilst Foucault's critique of language was embedded in the historico-epistemological, Magritte set about critiquing language through visual means (Foucault, 2008), as evident in *Ceci n'est pas une pipe*. Foucault (2008) emphasised the 'doubly paradoxical' (p. 23) nature of *This is not a pipe*; it is, on one hand, naming something that does not need to be named (because the likeness of the form of the pipe is familiar to viewers), while simultaneously denying that the object is what it is through the accompanying text (Foucault, 2008, pp. 23-24). As viewers, we are left to consider the relational aspect between image and text within the artwork. Is Magritte implying that the *word* 'this' *within the sentence* is not a pipe? Or is he implying that 'this' *as a sentence* is not a pipe; that is, 'this is not a pipe but a sentence saying this is not a pipe' (Foucault, 2008, p. 30). Or is it a case of expressing that the *image* above the sentence is not a pipe in the actual sense, but merely a drawing of one? Such a provocation offers a confronting problematisation of representation and challenges viewers to consider the contingency of meaning.

Such problematisations are important to hold in mind as we commence the analysis chapters. I begin the following analysis by traversing the *vertical axis* of CCS to explore the scalar implications of datafied logics on international, national and state education policy spaces and how these pertain to leadership. My analyses within this chapter are based largely on publicly available artefacts collected relating to Data Site 1 (Platforms) and Data Site 2 (Policy Documents) within the overall data corpus as outlined in Chapter 4 (section 4.6). These specifically include

policy documents, training and demonstration videos (which have been transcribed), static images from the platforms (screen-grabbed from training videos and policy documents), other related supporting documentation (e.g., publicity materials, implementation guides) and school-level planning and reporting documents gathered through extensive Internet searches. I 'think with' (Jackson & Mazzei, 2012) the concept of *groundless grounds* (Wittgenstein, 1969) to examine the epistemological foundation of educational leadership that is produced through and by the platformed infrastructures. I follow this analysis by introducing two key concepts – *recessive technologies* and *deferred expertise* – to theorise the foundational conditions produced in and by the platformed infrastructures. Firstly, though, I provide context around the national policy space and emphasise how it has come to be influenced by international performance discourses, and how this sets a specific policy regime for schooling leaders.

5.2 Developing a national school performance infrastructure

School performance is not a naturally occurring phenomenon, but it is rather something that has become distinctly embedded into how we can (and do) think about schools. In order to understand its empirical enactment, it is important to establish an understanding of the many scalar levels that influence data infrastructures which subsequently shape how educational leadership is being enacted. Many scholars have written about the global influence of international bodies like the OECD and their standardised testing programs (namely PISA) when it comes to how education systems are being governed (see, for example, Gorur, 2016; Lewis, 2020; Sellar & Lingard, 2014). Such international bodies often provide an impetus for comparative metrics to take hold to understand and compare system performance between countries. We can also see these comparative logics evident in the national Australian context during the Labor Government's campaign for the 2007 federal election. The establishment of the 'education revolution' from 2007-2013 set firm national priorities to address Australia's 'failing' schooling systems, and this discourse is now firmly entrenched in our current ways of understanding schooling performance.

Implemented as part of the federal Labor government's 2007 political campaign to align education practices and policies across Australia, this reform intensified the focus on standardised metrics in Australian education in an unprecedented manner (Savage, 2021b). The framing of education as a crisis in the preceding years – largely due to Australia's steady 'decline' on the OECD's PISA assessments – meant this campaign held strong popular appeal: education was in need of 'fixing' and a consistent national approach was presented as the most effective solution. While education would remain under the specific political authority and constitutional responsibility of the states and territories, this would be complemented with a major policy reform

to overhaul the Australian schooling system *nationally*. This was not about creating a national schooling system within the federal system but rather creating the appearance of one through a blending of national coordination with continued state autonomy. With the formation of a broad suite of interconnected national reforms, including the National Assessment Program – Literacy and Numeracy (NAPLAN),[22] the *My School*[23] website for reporting school performance and the National Schools Interoperability Program (NSIP),[24] the importance of consistent mechanisms for collating profile data and reporting achievement information at a national level was instilled (Savage, 2021b).

In the 2007 report *The Future of Schooling in Australia*, prepared by the Council for the Australian Federation (CAF) – also commonly referred to as the 'Dawkins Report' – an action plan was developed by a steering committee led by then-Secretary of the Victorian Department of Education and Early Childhood Development, Professor Peter Dawkins. This action plan was stated to hold 'substantial significance for *all governments* in Australia' (CAF, 2007, p. 4; emphasis added), creating a unique opportunity to 'commit to the future of schooling in Australia' (CAF, 2007, p. 4) by undertaking a nationalised approach to schooling improvement. In this plan, eight proposed areas of work were identified, including working towards national curricula (Area 1), testing to improve student achievement (Area 2) and reducing red tape (Area 6). Interestingly, this plan also included specific actions around 'reporting on performance' (Area 3), articulating the vital importance of 'meaningful' reporting on performance at the individual, school and system level. Specifically, Action 7 articulated the need for 'fair, public reporting on school performance, including a focus on "value added", paying attention to developments overseas' (CAF, 2007, p. 32). It was clear that the discourses of 'performance' were to be a central focus for State, Territory

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[22] NAPLAN is an annual assessment in which all students in Years 3, 5, 7 and 9 across all Australian schools are expected to participate in tests in reading, writing, language conventions (spelling, grammar and punctuation) and numeracy. It is managed by an independent statutory authority – the *Australian Curriculum, Assessment and Reporting Authority* (ACARA) – in collaboration with federal, state and territory representatives.

[23] *My School* is a website also managed by ACARA that contains data on all schools across all sectors in Australia. It was introduced to support 'national transparency and accountability of Australia's school education system through the publication of nationally consistent school-level data' (ACARA, 2025, n.p.).

[24] The NSIP is part of *Education Services Australia* (ESA), an organisation tasked with ensuring interoperability across the national digital learning infrastructure. Interestingly, ESA as an organisation is presently registered as a charity, according to the Australian Charities and Non-for-profits Commission (ACNC), despite receiving extensive funding from the federal government (approx. $30m AUD annually) and supplying zero dollars in charitable grant money to schooling organisations since it began reporting in 2013 (ACNC, n.d.).

and Federal Education Ministers, as well as those authorities managing the Catholic and Independent schooling sectors.[25]

Key to implementing this action and others associated was the establishment of the Australian Curriculum, Assessment and Reporting Authority (ACARA) to act as the national authority for all Australian education ministers (i.e., Federal, State and Territory). A key task for ACARA was steering the national agenda for performance reporting through the *Measurement Framework for Schooling in Australia* (initially established in 2010; with subsequent iterations published in 2012; 2015; 2019 and 2020). This document (and its subsequent iterations) defines the national key performance measures (KPMs) that provide 'nationally comparable data on aspects of performance' (ACARA, 2010, p. 5) for Australian education ministers to report to the broader community. The KPMs largely centre on NAPLAN proficiency standards (that are presently referenced to international test studies, including PISA, TIMSS and PIRLS),[26] as well as other key information pertaining to school enrolment, student attendance, school completion and demographic statistics (i.e., student disability status, geographic location, socioeconomic background, etc.). These measures form the basis of the annual *National Report on Schooling in Australia*, which is published on behalf Australian education ministers by ACARA.

It is important to note that the history of the *National Report on Schooling in Australia* precedes the establishment of ACARA. Currently in its thirty-fifth iteration (as of the completed 2023 report), this document has reported on many of the KPMs outlined in the current *Measurement Framework* nationally in reports prepared by previous peak bodies prior to the establishment of ACARA (such as the Curriculum Corporation for the *Ministerial Council on Education, Employment, Training and Youth Affairs*, or MCEETYA). However, the formation of ACARA and other national bodies, including the Australian Institute for Teaching and School

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[25] In Australia, there are three main schooling sectors: 1) *Government (public) schools* which are funded and managed entirely by state and territory governments and educate the majority of Australian students; 2) *Catholic schools* which are governed by Catholic Education Offices which are often coordinated through dioceses; and 3) *Independent (private) schools* which are operated by independent boards and organisations. It is important to note that all three schooling sectors in Australia receive substantial government funding, with the Catholic and Independent sectors receiving most of their public funding through the federal government, while public schools are funded mainly by state/territory government funding.

[26] TIMSS is an acronym for *Trends in International Mathematics and Science Study* and is a large-scale international assessment conducted every four years in Australia. Similarly, PIRLS is an acronym for *Progress in International Reading Literacy Study* and is a project of the *International Association for the Evaluation of Educational Achievement (IEA)*. Like TIMSS, PIRLS is also a large-scale assessment designed to measure how effective countries are in teaching reading literacy.

Leadership (AITSL), demonstrated the perceived need for performance data (and mechanisms for sharing and reporting these data) that would transcend state and territory boundaries and allow for discussions to be held about national schooling performance. Key to this was developing mechanisms of interoperability, so that the same KPMs could be measured in the same way regardless of geographic location or schooling authority. We can see evidence of this in the aforementioned *My School* website, which is managed by ACARA and which publicly reports nationally consistent school-level data based on NAPLAN performance and school demographic characteristics.

However, having these data is not enough in itself. Rather, different techniques and technologies that can capture and manage the sheer volume of this digital information have been required to sustain these data and make them productive. As will be discussed further on in this chapter through the empirical cases of Panorama and Scout, learning management system (LMS) platforms have become a necessary tool for systems to participate in these national data practices. ACARA, for example, refers to the *National Report on Schooling data portal* to provide real-time summaries of digital data associated with the KPMs in the form of a dashboard (see ACARA, n.d.). Since then, more Australian States and Territories have begun using and/or developing their own data platforms to provide schools with a specific subset of information pertaining to their performance, including Panorama in the Victorian context and Scout in the New South Wales context. This is perhaps unsurprising, considering the nationalised push for performance data and the subsequent need to collect these data and understand them as a core part of schooling leadership. Much in the same way that NAPLAN has become an institutionalised discourse despite ongoing negative commentary, the platformisation of education has, too, become a common practice (Lewis, 2022). The following section delves into state-level policy documentation from within each of the cases, in which we can see clear evidence of datafied performance discourses in policy.

5.3 Developing state-level frameworks from the national performance infrastructure

Following the establishment of a 'national' policy agenda and consensus, we can now consider how these broader discursive and material conditions have shaped what is possible at the level of the State. In 2015, New South Wales first implemented the *School Excellence Framework (SEF)* in response to reviews of both national and international practices to centralise and foreground the core of all strategic improvement work in public education across the state (NSW DoE, 2015). The implementation of the SEF provided schools with a framework to make 'informed and consistent judgements' (NSW DoE, 2015, p.24) about their performance progress as a school.

Prior to this, NSW followed the *Quality Teaching Model* (established in 2003, and still subsequently in use today) however the focus of this framework was largely centred on improving pedagogical practice rather than as a framework for evaluating school performance (DoE, 2025a). Rather, the SEF built on the *Performance and Development Framework for Principals, Executives and Teachers in NSW Public Schools* (DoE, 2014b) published in 2014 in agreement with the NSW Teachers Federation (DoE, 2014a, p. 134) to 'support the ongoing improvement of student outcomes through continuous development of a skilled, effective and professional teaching workforce' (NSW DoE, 2015, p. 89). This key document was also aligned to practices outlined in the AITSL standards. Such documentation was significant as it introduced and promoted a systemic approach to school improvement that covered the core domains of learning, teaching and leading. This reportedly met the Commonwealth National Education Reform Agreement obligation for all states and territories to implement a standardised approach towards school improvement (NSW DoE, 2015).

Since its inception, the SEF has continued to be developed (the SEF is currently in Version 3) and used to standardise school performance and set the conditions for continuous improvement agendas. This foundational document underpins the core work of the NSW Department of Education, as it supports all 'NSW public schools in their pursuit of excellence by providing a clear description of quality practice across the key educational domains of learning, teaching and leading' (DoE, 2024d, p. 4). A key part of this framework is the *School Excellence Cycle* (see *Figure 5.2*), which includes four central components: 1) a *situational analysis*, which is a 'rigorous assessment' of a school's current performance; 2) a four-year *Strategic Improvement Plan* (SIP), which outlines the school's future strategic directions and targets; 3) *implementation and progress monitoring* of the SIP; and 4) *annual reflection* of progress made in relation to the SIP and reporting this to the broader community (DoE, 2024d). For the principal[27] the Leading Domain within the SEF positions school planning, implementation and reporting as an essential role of 'excelling' in leading, alongside the management of resources and facilities:

> In schools that excel, the Strategic Improvement Plan [SIP] is at the core of continuous improvement efforts, with the school's vision and strategic directions evident in its activities. The plan is well-conceived, effectively implemented, and drives improvement. (DoE, 2024d, p. 16)

[27] Noting here that this documentation specifically refers to the principal as the 'primary educational leader' (DoE, 2024d, p. 15) within a school, though leadership teams are also mentioned within the Leading Domain.

The SIP[28] is published on the school's own website, along with the Annual Reports in a section entitled *School planning and reporting*, which is generic across all NSW government school websites.

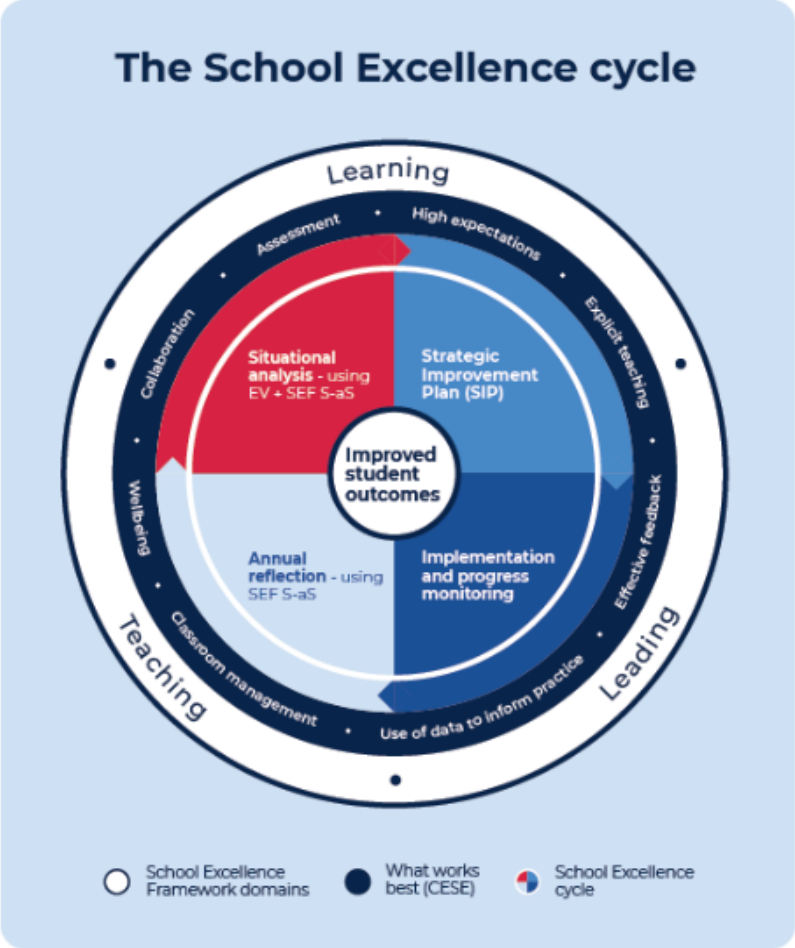

Figure 5.2: The School Excellence cycle (DoE, 2024b, p. 4).

Also in 2015, Victoria followed national suit in establishing the *Framework for Improving Student Outcomes (FISO)*[29] which was designed to give schools 'a common language for improvement' (DET, 2016, p. 1). Presented along with additional State funding, FISO provided schools with a way to determine how to best use their funding to 'get the best results and lift student achievement across the state' (DET, 2017a, p. 2) as a part of their bid to become the 'Education State'. FISO built on earlier models of state strategic improvement including its predecessor the *Effective*

[28] From 2025, SIP documentation has been renamed as *School Excellence Plans (SEP)* (DoE, 2025b). While there has been a change in the naming of this documentation, the fundamental remit remains the same.

[29] It is important to note here the similar language of a Departmental 'framework' for improvement across both cases, which arguably reflects the trend towards autonomous schooling and a decentralisation from the State.

Schools Model, which was the conceptual organiser for a number of Department strategies for improvement in teaching and learning (Glen Huntly Primary School, 2014). Like NSW's *Quality Teaching Model*, the *Effective Schools Model* was focused more on the use of effective pedagogy through a framework known as the *e*^{5} *Instructional Model* designed to facilitate conversations and professional reflections around classroom practice (DET, 2018). Like the SEF, improvement was at the heart of FISO including an improvement cycle which includes:

> undertaking a School Review every four years, complete quality strategic and annual planning, select evidence-based interventions and monitor these interventions to understand their impact on improving student outcomes. (DET, 2017a, p. 8)

Since its inception, FISO too has undergone minor changes and improvements, with the latest version being known as *FISO 2.0*. However, much like the SEF in the NSW context, which is currently on Version 3, I will refer to the current version of the Victorian Framework, FISO 2.0, simply as *FISO* from here on out for ease of reading and understanding.

FISO in the Victorian context provides a similar ethos to the SEF in the New South Wales context, insofar as it sets to 'realise the goals of excellence and equity through developing the learning and wellbeing of every Victorian student' (DET, 2024d, n.p.) (see *Figure 5.3*). It also acts as a foundational document to direct the work of all schools and their staff to actualise the Department's strategic goals (DET, 2023c). Like the SEF in New South Wales, in which 'Improved Student Outcomes' is at the core, student learning and wellbeing outcomes are similarly at the centre of FISO to represent a 'common goal' that all levels within the Department are working to address. An *improvement cycle* is presented as a way to implement FISO, much like the cycle that implements the SEF, and it similarly includes four key stages: 1) Evaluate and diagnose; 2) Prioritise and set goals; 3) Develop and plan; and 4) Implement and monitor (see *Figure 5.4*). The stages in the FISO improvement cycles support the four-yearly school review process, much like in the New South Wales context; however, they are not limited to this function. Schools are expected to draw on this improvement cycle as a common approach to conduct 'regular cycles of inquiry…from the whole-of-school to the classroom, and over different time periods, from 4-week cycles to annual cycles' (DET, 2023c, n.p.). Although there are slight variations across the two cases, we can see similarities in couplings of school performance with core behaviours of its material enactment, including things like strategic planning, regular monitoring and measuring progress.

Figure 5.3: FISO 2.0 (DET, 2022, p. 4).

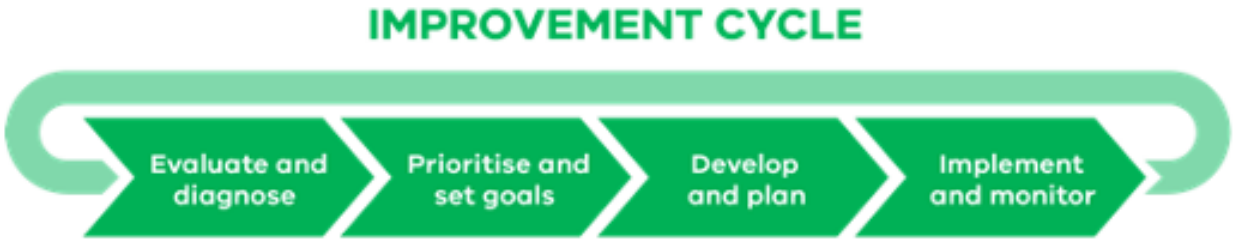

Figure 5.4: FISO 2.0 Improvement Cycle (DET, 2022, p. 4).

Measuring progress is another interesting concept that is deeply embedded within the frameworks of FISO (in Victoria) and the SEF (in New South Wales). Both frameworks discuss the need for 'system measures' to be included as part of the strategic planning documents that schools produce for the subsequent four-year period. In New South Wales, the SEF implementation policy outlines a best practice for completing the situational analysis, with the first practice aspect of best practice listed as engaging with the School Dashboard in Scout, whereby schools can 'consider their system-negotiated targets' (DoE, 2024d, p. 6). System-negotiated targets are required to be included as improvement measures within the SIP (DoE, 2024d, p. 8). Similarly, in Victoria under FISO, the system measures relate to core sets of data

that are mandatorily collected by all schools on a regular basis (either daily as attendance, or annually as NAPLAN). All these data sets are readily available in Panorama.

When such discourses are used interchangeably across multiple documents and sources, they become normalised, invisible and taken for granted. 'Thinking with' (Jackson & Mazzei, 2012) the concept of groundless grounds (Wittgenstein, 1969) can help to extend our understandings of the epistemological shift towards datafied representations and bring visibility to these leadership practices.

5.4 Setting the 'groundless ground' of datafication

It is important to acknowledge that our current ways of understanding school performance through datafied regimes are grounded in a particular set of conditions. Datafication, or quantified methods of measuring school performance, have formed the epistemological foundation on which we base our understandings of performance. Within the policy implementation advice for the SEF in New South Wales, principals and school leaders are required to provide an 'authentic and rigorous assessment of a school's current state' (DoE, 2024b, p. 6) to inform the next iteration of the school's SIP. As mentioned in the previous section, the SEF implementation advice includes guidance around 'best practice' for conducting this rigorous assessment, with the first item suggesting using the 'School Dashboard in Scout…to provide a snapshot of the current status of the school for each of the five focus areas' (DoE, 2024b, p. 6) of wellbeing, student performance, human resources, finance and enrolment. Here, we see the possibilities for understanding school performance clearly emerging from the conditions set by datafied discourses.

Wittgenstein (1969) proposed that such a foundation should be considered as a *groundless ground*: an understanding that all knowledge is based on an ontological foundation that is shaped by the available ways of knowing at a particular time and place. Over time, such propositions form a kind of epistemological bedrock, 'propping up knowledge' (Braver, 2014, p. 174) while concurrently melding into the background and becoming largely invisible (Hong, 2020). In the above example, the datafied metrics from Scout's dashboard align with the foundation for measuring school performance and driving improvement agendas. To uphold such a knowledge system, certain propositions must remain *hinged*; that is, there must remain a level of fixedness of some ideas for others to flow and activate around them (Wittgenstein, 1969), thereby making certain combinations of ideas possible and legitimate. For instance, collecting data in a digital platform such as Scout can only make sense if it is based on the solid ground of such data being objective, valid and useful; without this groundless ground providing a firm ontological foundation, the entire superstructure would collapse on itself. This creates an inability to question

how some things can and are known, since problematising the foundation too forcibly 'shakes too much of the edifice built above it' (Hong, 2020, p. 23). Scout's data representations – and the presumed validity and utility of the data contained therein – *need* to remain uncontested because contesting them threatens the entire foundation upon which SEF is based.

Following Wittgenstein (1969), Braver (2014) further develops the term 'groundless ground' to describe how we make sense of the world:

> We must appreciate both parts of the phrase, 'groundless grounds'. One the one hand, these understandings of Being do in fact ground an age. They constitute the deepest level of intelligibility we can access, and they determine and support the thought and action of an epoch. *These ways of understanding constitute a ground* by allowing us to experience anything, and by shaping how we experience almost everything. (Braver, 2014, p. 211; emphasis added)

Such an understanding is critical to problematising phenomena; accepting that the underpinnings of any philosophical thought can only take us so far because all onto-epistemologies are grounded in logics relevant to a particular time and place. But, while the bedrock of the groundless ground forms a solid foundation on which further thought is rendered possible, it is critical to remember the ground's inherent fragility. On this point, Braver (2014) notes:

> … on the other hand, these grounds are themselves groundless. They cannot be justified or legitimated because they are the source of our ways of justification and legitimation. (Braver, 2014, p. 211)

The groundless ground suggests that forms of knowledge, or ways of knowing, become buttressed by their own virtue (Holloway et al., 2023); that is, they cannot be considered illegitimate because they are the very source of their own legitimation. In the example of Scout, one cannot critique its foregrounding of data because it is built upon and legitimated by an understanding of being and knowing that presumes the value and utility of such data.

Connecting this to the rationale of data as neutral and objective as discussed at the outset of this thesis means that such understandings are contingent on a collective acceptance that objective reality exists in the world and it can be mined, extracted and utilised for knowledge creation (Hong, 2020). The datafication of schools and the quantification of their performance arises from this foundation (Holloway et al., 2023), and it builds upon the earlier fundamental acceptance of numbers as a form of authoritative and trustworthy truth (Porter, 1995). Those working in and for schools and broader education systems are faced with conditions in which their

acceptance of the datafied metrics presented in digital technologies, like Scout and Panorama, as a measure of success (or lack thereof) are necessary to their fulfilment of their roles as produced by the platformed infrastructures. Such truths about schools and their performance provide the ultimate grounds on which datafication can and does endure by constituting certainties in the pursuit of rational understanding (Ramón Cámara & Vega Encabo, 2022).

5.5 The rise of 'recessive' technologies

The pressure to perform upon the datafied groundless ground produces an inherent *need* for data technologies. There is a practical utility for their enactment, in which technologies close the gap forged by datafication between (the limit of) one's own sense-making abilities and the type of datafied knowledge that is valuable in the moment. This is true of many different forms; for example, the number of 'impressions' my post has received on LinkedIn as a measure of my reach and influence within a community of people. It is impracticable for me to gather such information and compute it myself (e.g., asking my friends and colleagues whether they have read my comment), especially when the technology to do so in an automated way is readily available. Thus, I know *through* LinkedIn's analytics instead. Similarly, a principal working in a school is unlikely to personally gather millions of data points and manually compute these to produce a specific subset of data for a performance report, particularly when such information – and the ability to perform innumerable calculations using this information – is readily available on a data platform's dashboard. We draw on the technologies at our disposal to participate effectively in knowledge regimes that are predicated upon the existence of the technologies needed to generate such knowledge, thereby influencing how we *see* and *understand* the world around us.

Scout in the New South Wales context can be considered a recessive technology that leaders can use to 'know' their school's performance in very precise and machinic ways. As discussed in Chapter 2 (section 2. 9), machinic sensibilities refer to the way that technologies, like platforms, encourage a responsiveness that is attuned to techno-logics. Such logics, like a leader expressing their school's performance as a numeric representation, become naturalised through regular engagement with broader policy and practices. In a short informative video on student attendance and engagement available on the DoE's website (DoE, 2023b) as part of the Scout training materials, there are numerous references to technological, or machine-like, thinking for Scout users to consider. In the opening lines of the video, getting to core contributing factors influencing attendance is expressed as a key component of work for schools to build student engagement. However, the language in which they express this indicates the need to deploy technology-oriented thinking:

> But before we start to engage with the factors influencing attendance, we need to consider the *headline metrics* of *attendance rate* and *distribution of attendance.* (DoE, 2023b; transcript - emphasis added)

Defining attendance rate and distribution of attendance as *headline metrics* reflects this machinic thinking in that it specifically prioritises datafied representations. Further to this, attendance rate is described as enabling the establishment of a 'clear baseline position' (DoE, 2023b), while the distribution of attendance can 'identify specific opportunities for growth in attendance' (DoE, 2023b). Like the LinkedIn example above, these are not beyond the human capacity to calculate, but they are perhaps beyond the capacity of the school leader to calculate *in a timely manner*, given the enormity of their role already. At the conclusion of the video, this machinic thinking is once again explained as necessary to properly consider student attendance and engagement:

> In summary, the headlines help us find where the opportunity or priority might be. The sub-trends help us better understand who the students are, the type of absence, and when it is occurring, bringing specific focus to the area of improvement we are hoping to achieve. Once we have that information, we can understand the contributing factors that might influence the attendance of a known group of students. (DoE, 2023b; transcript)

There are two very distinct moments here where the recessive technologies are positioned as 'helpers' that can (and should) influence the work of the leader: the *headlines* (or summary page within the platform) that points to an area that can be considered as a priority, and the *sub-trends* that can then be used to further unpack the headlines.

As explained by Andrejevic (cited in Sadowski, 2024), 'machines can step in to take on the information load that has become *too heavy* for humans to bear' (p. 314; emphasis added); that is, datafied technologies can better withstand the burdens of knowing in a metric-driven world. Hong (2020) theorises this epistemological out-sourcing as *recessivity*, or 'the bargain of knowing but not knowing for myself' (p. 57). In the above example, school leaders still 'know' about attendance and engagement in their school, but they only know this *through* Scout data representations, in which the platform serves as a lens through which to see specific elements of school performance. To know through the platforms' analytics, there is a need for users to adopt the kind of sensibilities that the platform itself engages with; machinic thinking that is just beyond scope of general human-sense making. The logics of learning analytics are premised on the very rationality that insights into learning are unattainable *without data* and their framing platforms (Knox et al., 2020). Using such a logic, insights into school performance relative to the current

conditions are equally unattainable without these data first being filtered through digital data platforms for human consumption. Such technologies, like Panorama and Scout, then become mechanisms via which knowledge can be known *through*, rather than known *with*.

Scout and Panorama are not the only platforms or digitised services within their respective platformed infrastructures that fit the profile for recessivity. Each of these recessive technologies is also connected to others as part of the broader infrastructures within each State-level context (see *Figure 5.5*). In Victoria, Panorama is closely connected to the Strategic Planning Online Tool (SPOT), a digital platform that facilitates the development of key planning documents, including the School Strategic Plan (SSP) and the Annual Implementation Plan (AIP) (DET, 2024b). SPOT pulls data from Panorama and other sources from within the platformed infrastructure (e.g., CASES21[30]) and uses this information to auto-populate key parts of reports (e.g., the 'School Performance Summary' in the Annual Report to the School Community). SPOT is accessible by leaders working *within* schools (i.e., the principal), who can access strategic and other information about their own school via this platform, as well as being accessible by leaders working *with* schools. This includes the network Senior Education Improvement Leaders (SEILs) and Education Improvement Leaders (EILs), who are tasked with overseeing the progress and operations of a designated number of schools.[31] SEILs endorse SSPs and AIPs within SPOT based on a predetermined timeline.

[30] Computerised Administrative System Environment for Schools (CASES21) is a mandated electronic recording system for school administration processes and information, such as attendance, enrolment details, incidents, financial activities, asset recording, etc. (DET, 2024).

[31] SEILs and EILs are generally allocated around 50 schools in their Victorian regions to monitor.

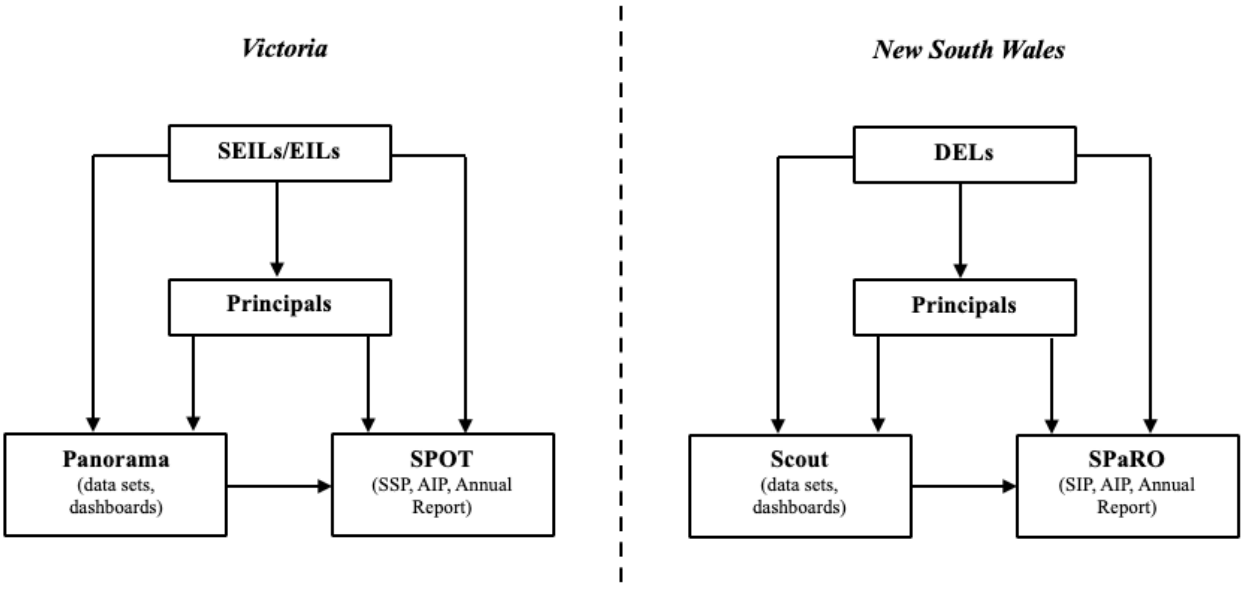

Figure 5.5: A diagram demonstrating the connectiveness of the platforms and their access in Victoria and New South Wales. Each data platform (Panorama and Scout) feeds the respective data into the planning platform (SPOT and SPaRO). The principal (and nominated leaders) can access the platforms relative to their own school, whereas the more senior leaders (SEILs/EILs and DELs) can access the platforms on an individual level (i.e., what the principal sees) as well as at a network level (i.e., an overview of all schools in their purview).

Similarly, the School Planning and Reporting Online (SPaRO) platform is used in a comparable way to support the strategic planning of schools and the Department in the New South Wales context. Much like how SEILs/EILs are required to monitor the strategic development of schools via SPOT, Directors of Educational Leadership (DELs) can view the progress of their nominated schools in terms of their engagement with the annual reporting and strategic planning requirements. SPaRO is also connected to the School Website Service, whereby once the annual report is published in the platform, it is automatically loaded to the school's website within a 24-hour period (DoE, 2024e).[32] Such *interoperability* (i.e., the exchange of data) between platforms within systems is a core feature of the application programming interfaces (APIs) of a particular platform (Perrotta et al., 2021). Interoperability also generates systemic implications for the educational leaders who are tasked to work *with* schools. For these leaders, the platformed infrastructure produces the conditions whereby SPOT and SPaRO become necessary technologies

[32] This made the process for collecting school-level strategic planning documents and annual reports much more streamlined in the NSW context given that all documents were located under the same tab on the individual school websites (About our school – School planning and reporting).

to engage with. They are recessive technologies in the sense that they can know about the schools SEILs/EILs and DELs are responsible for overseeing but in a very specific, datafied manner.[33]

While I have so far focused on recessive technologies as somewhat whole components (i.e., Panorama, SPOT, Scout, SPaRO), there are also other components embedded *within* these technologies that align with the conceptual definition of recessivity. Algorithms are one such aspect that also facilitate recessive conditions. In the Victorian context, the Differentiated Schools Performance Method (DSPM) is an approach that was introduced to state government schools in 2017 as a way of emphasising the need for schools to demonstrate continuous improvement (DET, 2019, p. 3). Within this approach, two related dimensions of performance results – 1) current performance and 2) change in performance over time – are used to aggregate a school's results within six different performance domains – achievement,[34] school climate, student attitudes, participation, engagement and senior secondary[35] (DET, 2021b) (see *Figure 5.6*). Schools are then assigned to a specific performance group based on their aggregated results – *Transform*, *Stretch*, *Influence*, *Renew* or *Recharge* (DET, 2021b). Each of these performance groups carry their own definition (see *Figure 5.7*) and are then collated to assign schools to an overall performance category. These categorisations subsequently determine the level and type of 'tailored support' schools receive annually following the release of the performance reports, including the 'frequency of monitoring from the Department' (DET, 2021b, n.p.). Additionally, the DSPM 'sits alongside the school review model' (DET, 2021b, n.p.), whereby the performance groups are used to determine the duration of the four-yearly scheduled school review. These reviews are typically three or more days in duration; however, schools that are grouped in the 'influence' category are generally permitted to partake in the minimum duration, which is two days (DET, 2024h). This potentially indicates that they require 'less work' to consider their school's performance.

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[33] Interestingly, the effectiveness of a regime where principals in NSW schools are overseen by DELs has been questioned recently in the media. Baker (2022) reports that principals in NSW schools do not find that their DEL has a positive impact on their workload. In a recent survey of secondary principals, it was found that less than a third reported that their assigned DEL had a positive impact on their own workload, and that only a quarter felt that the work of the DEL positively influenced student outcomes in their school (Baker, 2022).

[34] In school performance reports, the 'achievement' performance domain is separated into two distinct categories: Achievement (Reading) and Achievement (Numeracy).

[35] The senior secondary performance domain is only relevant to providers of secondary level education as it draws on measures of student achievement in VCE English and VCE/VCAL completion rates.

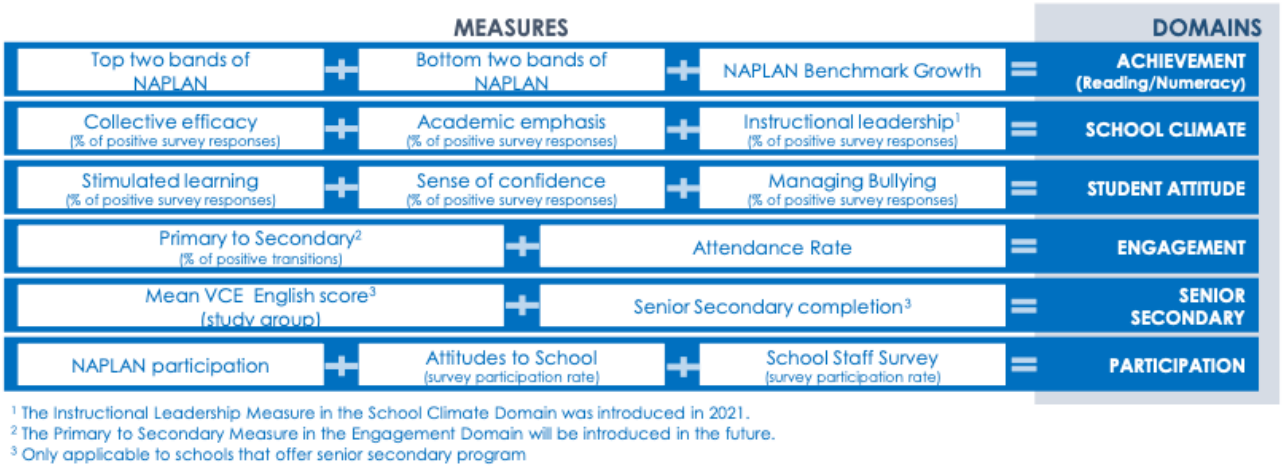


Figure 5.6: Measures and Domains in the DSPM (DET, 2023d, p. 88).

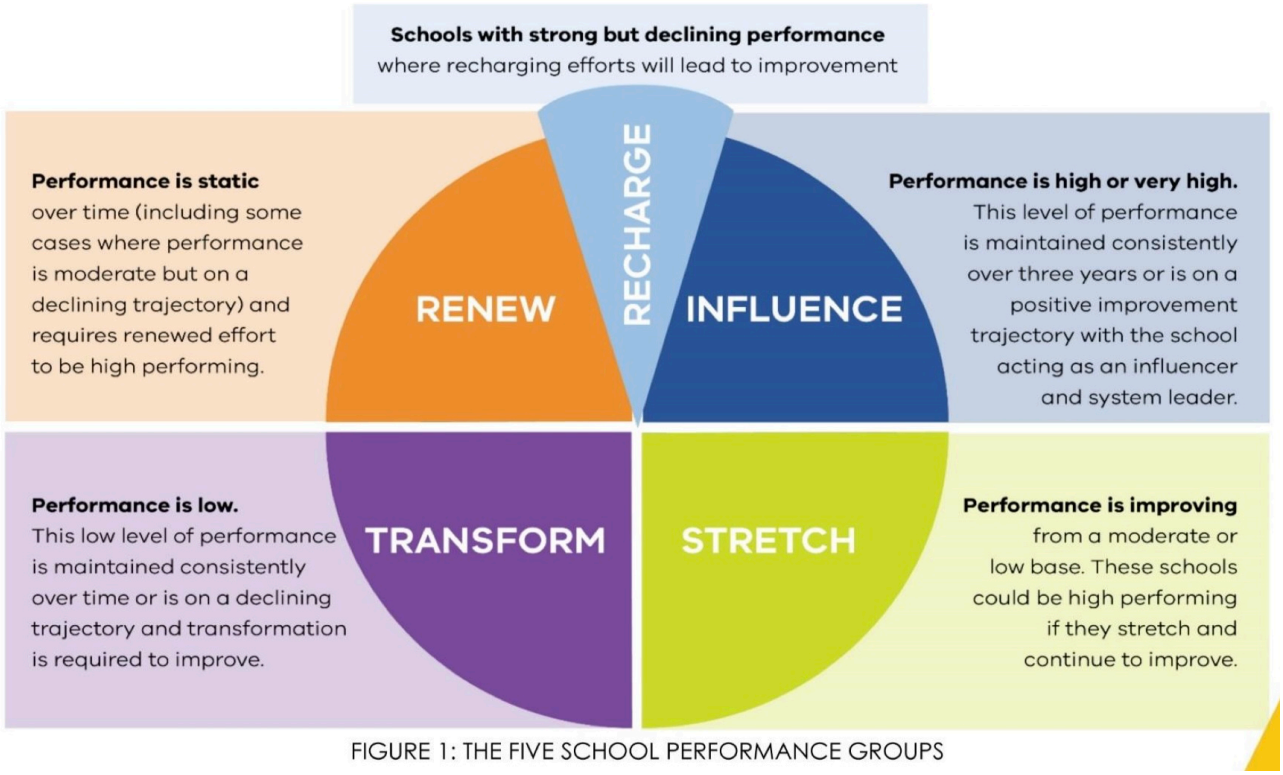


Figure 5.7: The five school performance groups and their associated explanations (DET, 2021b).

The DSPM as a recessive technology has a strong influence, despite it not necessarily being mandated at an individual school level. There is no requirement that explicitly states leaders working in schools *must* engage with this method, nor is it explicitly labelled as a necessary component of FISO. However, its entanglement within other key processes is what necessitates its use. For example, the DSPM is used to assign schools to performance groups, which impacts the length of a scheduled four-yearly review, which is a core part of the process for reflecting on and planning out the next SSP. This does create some complications, however, for schools that do not fit the remit. Some schools do not create sufficient data points for the DSPM to calculate an

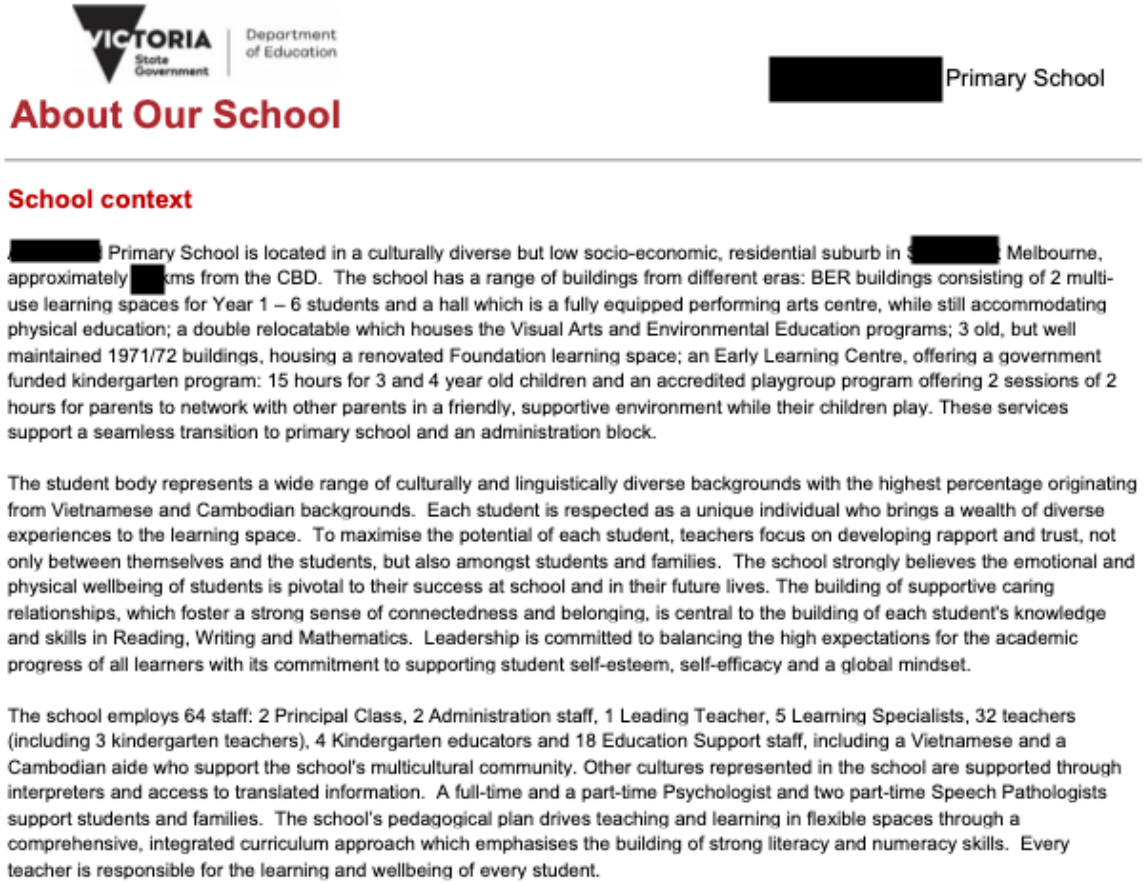
'accurate' measure of performance (e.g., as a result of small student cohorts, like in a small school). In such cases, these schools receive a performance label of 'not grouped', thus rendering them as 'statistically invalid'. However, for most schools, their assigned performance groups become a valid truth that must be engaged with at some point, either by virtue of the individual school leader or by a departmental overseer. Engagement with such truths not only requires the acceptance of the metrics and measurements of performance, but also the mechanisms via which these metrics and measurements are produced. In such instances, there is a 'deferring' of expertise from the human actor (e.g., the principal) to the technology (namely, the platform) that is required for school leadership to be aligned with the broader conditions produced by the platformed infrastructures.

5.6 Creating conditions for deferred expertise

Drawing on Gerrard and Holloway's (2023) assertion that expertise is a political and social construct embedded in complex constructions of power, we can theorise that datafication and the turn towards recessive technologies are producing the conditions for a deferring of expertise from school leaders to digital platforms within leadership regimes. In Victoria, the data from Panorama is used in schools' *Annual Report to the School Community*, a keystone document generated annually as part of the school's reflective process for determining strategic improvement. Roughly fourteen pages in length[36], this document encompasses two distinct parts: 1) an 'About our school' section in which the principal chronicles the school's key achievements throughout the year; and, 2) a 'Performance summary' which is compiled by the Department's platforms (i.e., Panorama, SPOT) and shows a visual representation of the school's performance (DET, 2025). *Figure 5.6* shows a deidentified sample from the 'About our School' section in an annual report, while *Figure 5.7* shows a sample from the 'Performance Summary' section. It is a legislative requirement for all Victorian government schools to publish this report on the Victorian Registration and

[36] In the selection of Annual Reports gathered for this research in Data Site 3 (n = 127), the overall length of the annual report ranged from eleven pages to nineteen pages. The final length of the report varied depending on the level of input by principals into the first section 'About our School' (whereby some principals included more written commentary than others) and also depending on the school context (P-12 schools had more data sets to share in their second section, 'Performance Summary').

Qualifications Authority (VRQA) State Register; they are also encouraged to publish this report on their own school websites as a mechanism for community distribution (DET, 2025).[37]



VICTORIA State Government | Department of Education

[redacted] Primary School

About Our School

School context

[redacted] Primary School is located in a culturally diverse but low socio-economic, residential suburb in [redacted] Melbourne, approximately [redacted]kms from the CBD. The school has a range of buildings from different eras: BER buildings consisting of 2 multi-use learning spaces for Year 1 – 6 students and a hall which is a fully equipped performing arts centre, while still accommodating physical education; a double relocatable which houses the Visual Arts and Environmental Education programs; 3 old, but well maintained 1971/72 buildings, housing a renovated Foundation learning space; an Early Learning Centre, offering a government funded kindergarten program: 15 hours for 3 and 4 year old children and an accredited playgroup program offering 2 sessions of 2 hours for parents to network with other parents in a friendly, supportive environment while their children play. These services support a seamless transition to primary school and an administration block.

The student body represents a wide range of culturally and linguistically diverse backgrounds with the highest percentage originating from Vietnamese and Cambodian backgrounds. Each student is respected as a unique individual who brings a wealth of diverse experiences to the learning space. To maximise the potential of each student, teachers focus on developing rapport and trust, not only between themselves and the students, but also amongst students and families. The school strongly believes the emotional and physical wellbeing of students is pivotal to their success at school and in their future lives. The building of supportive caring relationships, which foster a strong sense of connectedness and belonging, is central to the building of each student's knowledge and skills in Reading, Writing and Mathematics. Leadership is committed to balancing the high expectations for the academic progress of all learners with its commitment to supporting student self-esteem, self-efficacy and a global mindset.

The school employs 64 staff: 2 Principal Class, 2 Administration staff, 1 Leading Teacher, 5 Learning Specialists, 32 teachers (including 3 kindergarten teachers), 4 Kindergarten educators and 18 Education Support staff, including a Vietnamese and a Cambodian aide who support the school's multicultural community. Other cultures represented in the school are supported through interpreters and access to translated information. A full-time and a part-time Psychologist and two part-time Speech Pathologists support students and families. The school's pedagogical plan drives teaching and learning in flexible spaces through a comprehensive, integrated curriculum approach which emphasises the building of strong literacy and numeracy skills. Every teacher is responsible for the learning and wellbeing of every student.

Figure 5.6: A deidentified sample of text from the 'About our School' section in an Annual Report.

[37] Unlike the NSW setting, in which all school reports are automatically uploaded to a specific place on their website, Victorian principals are tasked with manually uploading their Annual Reports to their respective school websites. Given that Victorian schools do not use a central website operator (like the School Website Service in NSW) and thus manage their own website design, this can make it challenging to locate where such documents are on the website (that is, if they are there at all).

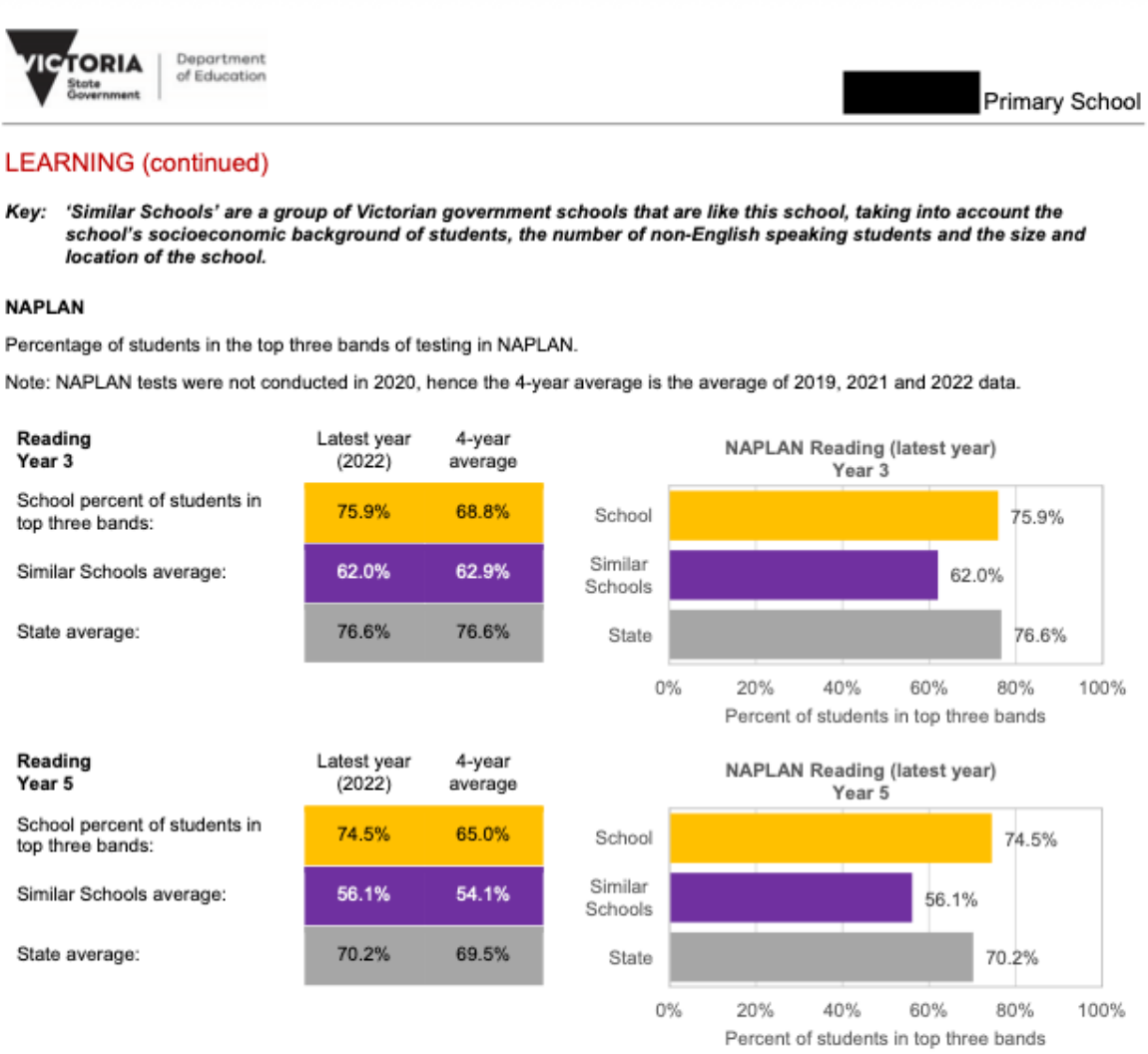


Figure 5.7: A deidentified sample from the 'School Performance' section in the same Annual Report depicted in Figure 5.6.

Within the first part of this report, principals and school leadership teams can demonstrate their school's progress towards strategic goals through written summaries covering three core subsections relating to learning, wellbeing and engagement (DET, 2025). As per policy, schools are 'encouraged to reference learning [or wellbeing/engagement] data from the performance summary' (DET, 2025, n.p.) in these written subsections. The second part of the report is a computer-generated 'Performance Summary', which provides stakeholders with a succinct overview of how the school contributes to Education State priorities and how it compares with other Victorian government schools. Interestingly, the Performance Summaries are auto-generated within the SPOT platform,[38] whereas principals and other relevant leadership staff are specifically

[38] Additionally, there is also graphical alignment within the Panorama dashboards and the Performance Summaries, with the very same shades of yellow and purple being used for comparisons across both formats.

named as being responsible for delivering the written commentary for the first section of the report. In this way, principals are passive recipients of their performance summaries in that they cannot change or alter how these data are presented, or which parts of it are presented, to their school communities.

Given the encouragement (via policy) to use the performance summary to illustrate the commentary presented by the principal, there appears to be a privileging of these performance representations over that of the principal's perceptions. Even though policy does not stipulate that the data presented within the performance summary *must* be used, there is an assumption that alignment must be present between the two sections of the report. That is, whatever the principal is writing about the school must also adhere to the overall representations of performance generated in the performance summary. This is further encouraged in policy guidance, which stipulates that schools should use the written commentary to 'give further context to data contained in the Performance Summary' (DET, 2023a). Since the performance summary *cannot* be altered (because it is auto-generated), it makes sense to defer expertise to Panorama's analytics, as this will ensure alignment between the human-produced commentary and the platform-generated report. Such practices were evident when examining a sample of these annual reports, whereby principals had indeed opted to draw on the data sets available in Panorama to bolster their reflective comments. In one deidentified annual report, for example, in the learning subsection, the principal framed their response around the NAPLAN and teacher judgement data presented in the accompanying performance summary (see *Figure 5.8*). Here, their commentary is strictly associated with providing a written summary of the visual information presented in the performance summary. In another deidentified annual report, however, we can see how the principal has drawn on the data presented in the performance summary to illustrate the measured impacts of their specific wellbeing focus (see *Figure 5.9*). Each of these examples demonstrate the deferring of expertise required in order to write a commentary section that aligns with the auto-generated performance summaries.

Learning

NAPLAN:
2022 Year 3 Reading and Numeracy achievement based on the percentage of students in the top three bands indicates very pleasing results that were above state average and similar schools average.
In Year 5 Numeracy, our four year average of students in the top three bands is above similar schools and our Year 5 Reading four year average of students in the top three bands is slightly below the state average and similar schools average.
Teacher Judgement:
As measured by teacher judgement, in 2022 81.1% of students were reported as at or above expected standards in English and 77% in Mathematics. Both of these results were similar to results in the previous year.
Tutor Learning Initiative and High Ability Program:
The Tutor Learning Initiative allowed us to provide additional Literacy and Numeracy support across various grades with two part time tutors. Additionally, a small number of students were accepted into the Victorian High-Ability Program which supported our high achieving students to broaden and extend their learning in the areas of English and Mathematics.

Figure 5.8: A deidentified sample of commentary from the learning subsection within an annual report.

Wellbeing

[redacted] College focused on building the capacity of all staff to support the wellbeing needs of students. School Wide Positive Behaviour Supports was re-launched to ensure consistency of delivery across all three sectors. As a result, the School Wide Positive Behaviour Support team increased throughout the year. Further professional learning to embed the Berry Street Education Model trauma informed practice was undertaken. [redacted] College became a lead school for Resilience, Rights and Respectful Relationships.

The Well-being indicator, a Sense of Connectedness from the Attitudes to School Data in 2022, indicates that in Year 4 to 6, 47.4% of students were connected to school, with a higher 4-year trend of 59.7%. Both indicators are below both like schools and the state average. However, the 4-year trend indicates the impact of COVID and remote learning on our student's connectedness to their school is still a factor. In Year 7 to 12, 37.8% of students in 2022 were connected to the school, with the 4-year average of 41.6%. This was slightly lower than like schools 7 to 12.

Figure 5.9: A deidentified sample of commentary from the wellbeing subsection within an annual report.

We can see a similar deferring of expertise in the New South Wales setting. As in Victoria, the Annual Report is a statutory requirement for all New South Wales government schools to 'provide the community with information on the school's progress towards achieving the strategic directions in the Strategic Improvement Plan' (DoE, 2024b, p. 14). This policy goes as far as to outline the specific requirements for principal completion of the report, with most mandatory elements of the report – such as workforce information and NAPLAN performance summaries – being auto generated by department information. The policy presents a table of required actions for completing the annual report (e.g., a cover page, an introduction, a self-assessment of performance, financial information, etc.), with half of these aspects requiring no human action as they are automatically generated[39] (DoE, 2024b, pp. 15-16). This table also outlines descriptions for each of the relevant aspects to be completed as part of the annual reporting process, with the majority of these aspects recommending the use of particular data sources, and three of these

[39] Similar to Victoria, the Department of Education in New South Wales generates these aspects of the reports in a related, but separate, digital platform called School Planning and Reporting Online (SPaRO).

listing Scout data specifically. Thus, we see here a more overt prompt than in the Victorian context for principals to defer their expertise to the data framing platforms to attest to how they know their school's performance.

Recessive technologies encourage the deferring of expertise through their broader infrastructures. Returning briefly now to the documentation around FISO in Victoria; when planning for school improvement, the first step in the cycle is to *evaluate and diagnose*, which requires gathering and analysing data (DET, 2022, p. 4). In this implementation document, the Department provide a 'recommended' list of data sources for schools to use when measuring their current performance, comprised firstly of system measures, followed by additional standardised assessments and school-based assessments (DET, 2022, p. 4). The system measures are, once again, a list of the data sets collated in Panorama as well as being the key measures used within the DSPM to group overall performance. Key questions are provided to assist schools with the analysis (see *Figure 5.10*), with the system measures questions pointing towards engaging with Panorama. While the first question is the only one to mention Panorama specifically, we can see reference to the type of machinic language representative of the platform (as discussed in the previous section), whereby engagement with the platform is necessitated. Specifically, data measures relative to other schools are only knowable *through Panorama*. Necessary engagement with the first prompt sets the scene for the rest of the section, in conjunction with the available of the system measures on Panorama, creating conditions that encourage the leader to continue their ongoing engagement with the platform to demonstrate their school's performance.

Data source	Questions
System measures	• How does our performance data compare with similar schools (see Panorama)? • Have we been stable, improved or declined relative to other schools over the last three years? • Have we been stable, improved or declined relative to our own data over the last three years? • On which measures is our own performance strongest and weakest? • On which measures, if any, are stronger and weaker performances against similar schools evident?
Additional standardised assessments	• Do our school-based standardised assessment results reflect the findings from the analysis of system measures? • If not, what might explain any discrepancies? • Are there particular cohorts, grades or classes that we may need to concentrate on? (e.g., do students have lower numeracy outcomes in Year 9 or do students in Year 12 have an increased amount of severe chronic absence?)
School-based assessments	• Where applicable, do our school-based formative and summative assessment results reflect the findings from the analysis of system measures and school-based standardised assessments? • If not, what might explain any discrepancies? • Does this data suggest particular cohorts where performance is not as strong

Figure 5.10: Suggested questions to support the process of data analysis (DET, 2022, p. 6).

Similarly, conditions that encourage school leaders to defer their expertise over to recessive technologies can also be found in documentation regarding the development of strategic planning in both the Victorian and New South Wales contexts. In an implementation advice document in the Victorian context (DET, 2024c) for developing the School Strategic Plan (SSP),[40] guidelines for writing targets are provided. Within the general advice section, Panorama is listed as a source schools can draw on, in addition to a number of other points that suggest the use of Panorama through their connection to numerical measures:

> Targets are expressed as a proportion of students (e.g. X% of Year 7 students) and should include a baseline figure and a numerical target. (DET, 2024c, p. 3)
>
> Schools are encouraged to use the FISO 2.0 system measures where appropriate for their context, as these measures have been identified as having the largest impact on and correlation to positive learning and wellbeing outcomes. (DET, 2024c, p. 3)

[40] SSP is used interchangeably with SIP, depending on the age of documentation, but still refers to the same overall four-year strategic planning document/process.

Given that percentages feature heavily as a component of the Panorama dashboards, and that FISO system measures are all available within Panorama, it is reasonable to assume that school leaders would deferring expertise to Panorama to develop these targets. This document also offers advice regarding 'things to avoid when developing targets' (DET, 2024c, p. 3). This section entails three core pieces of advice in what should be avoided when preparing targets (DET, 2024c, p. 3; emphasis added):

> Expressing targets *without a numerical figure* (e.g., 'improve NAPLAN benchmark growth', which lacks a baseline figure and target figure).
>
> Using phrases like 'state average' or 'similar schools average' as a target (e.g., 'will be at the same level as the stage average'). This should be avoided as state averages and similar school averages change each year. If schools wish to reference similar school or state averages, they should do this using a *baseline figure drawn from that dataset*, and then set their own target (e.g., 'increase NAPLAN above-level benchmark growth from 20% (2022 similar schools average) to 37%').
>
> Using only one data source (e.g., NAPLAN) for all targets in one goal. *Multiple sources of data* support schools to build a more accurate and holistic picture of progress towards a goal, as well as allowing schools to triangulate data so that they can verify their progress.

Here, the advice is clear that when developing targets, schools should use numerical (datafied) figures, refer to baseline averages that are contextualised and draw on multiple sources of data for each goal. Again, engagement with Panorama becomes a necessary part of the strategic planning work without the need to mandate it; there is enough entanglement between discourses and procedures to ensure that it is remembered and drawn on as a useful tool. While school leaders ultimately formulate the final words in the targets, the conditions produced here by the platformed infrastructure encourages them to defer to the data-rich expertise of Panorama. In the New South Wales context, the advice to defer to Scout is presented in a much more overt manner, with the platform being specifically listed across multiple documents. Recessive technologies, like data platforms, thus become positioned as legitimate representations of schools and their performance. This requires a deferring of human expertise by those in positions of leadership over to the recessive technology to 'know' school performance in line with the onto-epistemological foundations of datafication.

5.7 Discussion: Productions along the vertical axis

When considering the vertical axis of Comparative Case Study, Bartlett and Vavrus (2017) remind us of the need to conceptualise the vertical in terms of networks, rather than merely scalar levels. That is, rather than just considering pre-determined policy levels and how a 'top down' approach filters from policy production into lower levels of policy enactment, it is important to consider the various flows of knowledge that come as a result of complex network relationships. This is important given the clear precedent established by the national infrastructure around the need to measure school performance; it would be straightforward to simply examine the enactment of the national policy infrastructure at the State levels in the New South Wales and Victorian contexts. However, the vertical axis in CCS reminds us that social relations are highly complex and naturally extend beyond the boundings of pre-defined levels. As such, it has been important to consider how leadership within platformed infrastructures is far more dynamic and has developed as a result of many different factors.

The analysis in this chapter has traced the connections among the 'different actors and authoritative texts' (Bartlett & Vavrus, 2017, p. 74) across different scales through the two core cases of platformed infrastructures, namely Panorama and Scout. Such analysis has been useful to respond to the first research question which seeks to explore how the logics of datafication are shaping the technologies used within educational leadership. Specifically the vertical axis helps us to consider how the state departments of education within the New South Wales and Victorian contexts have responded both 'similarly *and* differently' (Bartlett & Vavrus, 2017, p. 75) towards national developments in education. Importantly, we have seen how these two states have developed their own 'Framework' documents – the School Excellence Framework (SEF) in New South Wales and the Framework for Improving Student Outcomes (FISO) in Victoria – as the basis of policy reform agendas that prioritise the continuous improvement of schools for the betterment of student outcomes. Each of these policy frameworks emphasises the need for 'system measures' to be used to demonstrate improvement across the life cycle of a school's strategic plan. The recommended system measures that are outlined and discussed in accompanying policy documentation are strongly aligned with (but not explicitly tied to) the KPMs defined in the nationally produced *Measurement Framework for Schooling in Australia*.

As seen through the analysis, a key point is that the use of the platforms Scout and Panorama are not specifically mandated within policy. I also do not wish to overstate the bounds between the international, national and state contexts here. Rather I see the discourses of datafication permeating through these various scales and influencing the development of policies within spaces of educational leadership. In this research, this has occurred largely around the topic

of school performance, which has acted as a point of comparison across the various scalar spaces. Comparatively, we can see how decisions at the national level have permeated through to the state level through similar language being used, though their representation is still unique to each state. Ultimately, we have not seen the development of a national platform for understanding school performance. But we have seen the states of Victoria and New South Wales develop their own platformed infrastructures to participate in the important leadership work around understanding and responding to school performance.

Arguably, such developments were necessary in order for schools and their leaders to respond accordingly to policy that requires them to participate in regimes of datafication. Complexly, these regimes are linked to broader societal trends towards a 'trust in numbers' (Porter, 1995) to provide objective information that is both standardisable and comparable. There is a need, therefore, for leaders to engage with 'recessive technologies' (Hong, 2020) like data platforms in order to conduct their work more efficiently and effectively within these datafied regimes. Given that leaders are being required to know their school performance in quite specific ways as articulated in national policy settings, it is only logical that the use of digital data technologies, like platforms, have become integral to conducting key aspects of their leadership work around strategic planning. This requires a reshaping of leadership techniques whereby expertise is deferred over to the data platforms to know *for* the embodied leader; the platforms are able to make sense of a voluminous amount of data with greater ease than human cognition could. However, this is not without consequence, as we will see in the subsequent chapters.

5.8 Conclusion

This chapter has demonstrated how pressures to perform on the groundless ground of datafication creates the need for recessive technologies, which subsequently defers expertise from school leaders to digital data platforms. Both Panorama and Scout serve as examples of what Hong (2020) describes as 'recessive technologies', which enable school leaders working *within* and *with* schools to understand and know school performance *through* the technology. However, the mere presence of the platforms does not necessitate their use. Their enactment is far more entangled in their broader logics of platformisation and data infrastructures. In this way, school leadership is being thoroughly re-professionalised through the platformed infrastructures: effective school leadership can only be actioned and recognised *by using* the platform, regardless of the respective expertise or ability of the school leader.

While we are living in a time where it is difficult to imagine a departure from a datafied life, this does not negate the need for criticality of digital data techniques, platform technologies

and their broader infrastructures within educational systems. Gillespie (2014) reminds us that research into data platforms needs to 'unpack the warm human and institutional choices' (n.p.) that underpin such technologies. While leaders are indeed being encouraged to defer their expertise, it is crucial to remember that these very technologies, their interfaces and their algorithms have been designed by people, as have the related policies that encourage and foster their use. A Wittgensteinian interpretation argues that 'our classifications don't mirror the way things are, not because they're wrong but because there is no *Way Things Are*' (Braver, 2014, p. 177; emphasis added). In the context of the platform, the judgements made and displayed in the dashboard are simply that: judgements based on imprecise human decisions, not precise measurements. Much like the provocation by Foucault when discussing Magritte's *The Treachery of Images*, such judgements mirror our current ways of *understanding* educational performance, not the educational performance itself.

While datafication seemingly produces a solid foundation on which recessive technologies can, and do, thrive, we must also remember that such a foundation is essentially 'groundless', and therefore open to possibilities for change. Critical lines of enquiry offer opportunities to unsettle this ground and to disrupt 'normal service' in measured doses (Buchanan, 2021). This means not completely rejecting the platformed infrastructures but, rather, creating moments and spaces of dissent to critically consider their impact on school leaders and their enactment of agency. It also means questioning who is knowing on behalf of others, and the type of knowledge that is being privileged in a particular epoch. This requires sitting in the tension created by the groundless ground of datafication colliding with dissonant thinking. Ultimately, we must work from the same foundational vantage point on which we are trying to implement change, lest we descend into an abyss where 'it's turtles all the way down' (Braver, 2014, p. 173).

In the next chapter, I attend to the temporalities produced within the platformed infrastructures. That is, I consider the way that temporal leadership conditions are being (re)shaped by the platforms (namely Panorama and Scout) and their broader infrastructures to produce 'present' understandings of school performance.

Chapter 6: Temporal

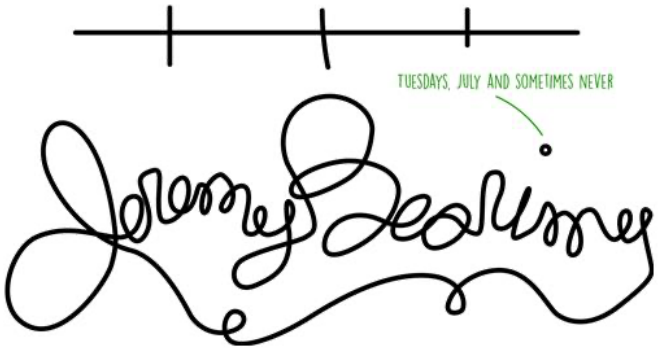


Figure 6.1: *Jeremy Bearimy* image.

From *CharGrilled*, retrieved from https://www.chargrilled.com.au/t-shirts/Jeremy-Bearimy-t-shirt.g. 2002 – 2025 CharGrilled Australia.

Not a traditional artwork, but a visual representation nonetheless, this image is taken from the NBC television show The Good Place*, which is set in a fictional 'afterlife'. Main character Michael (Ted Danson) explains the time flow in the afterlife relative to time on Earth (which is linear) to be curvy, non-linear and resembling the words 'Jeremy Bearimy', where no clear past nor future exist. The penultimate part of the joke is when asked what the dot above the i represents, which is expressed to be an isolated point that contains 'Tuesdays, July and also sometimes never'.*

6.1 Introduction

Following from the previous chapter in which the foundational conditions for leadership were discussed, I now turn to discuss the temporalities that operate on and within the platformed infrastructures of Panorama and Scout. In this chapter, I will argue that platformed infrastructures produce time relations, or 'temporalities', for and within educational leadership. This chapter focuses on the transversal axis of the CCS methodology as a specific reminder of the inextricable connection between time and space, thereby attending to the second research question: *How are digital data techniques and technologies (re)shaping leadership temporalities?* As with Chapter 5, the focus here is to problematise practices and make visible that which has become naturalised. Much like how 'Jeremy Bearimy' in *The Good Place* as a timeline makes little sense to those outside of its general socio-temporal context, we will see how configurations of temporality within platformed infrastructures are very much context-dependent.

As argued by Lingard (2021), although temporality has been largely overlooked in policy studies in preference of a concern for the spatial, it has nonetheless remained an embedded if not implicit component (see, for example, Decuypere et al., 2022; Lingard & Thompson, 2017; Lunde & Piattoeva, 2025; Thompson & Cook, 2017). Whether explicitly stated or not, the temporal is an important consideration within policy studies, as policymaking takes place both *in* and *in relation to* time (Strassheim, 2016). Relatedly, it is also important to attend to the impacts of digital technologies on producing particular configurations of time (see, for example, Alirezabeigi et al., 2023; Lunde, 2024). Therefore, studies of policy ought to attend to these temporal conditions, particularly when considering the broader infrastructures of policy, data and digital technologies involved. My analyses in this chapter are based on empirical research conducted around carefully scrutinised documents that make up part[41] of the platformed infrastructures for both Panorama and Scout. These specifically include policy documents, training and demonstration videos, static images from the platforms, other related supporting documentation, and school-level planning and reporting documents. Throughout this chapter, I utilise a 'thinking with theory' (Jackson & Mazzei, 2012) approach informed by the concepts of *temporal horizons* (Luhmann, 1976) and *data hygiene* (Mulvin, 2021) as an analytical heuristic to explore the temporalities produced within Panorama and Scout and their associated infrastructures.

First though, I begin by discussing the empirical cases and how they produce (and are produced within) specific temporalities for educational leadership. I then discuss the temporal productions of the platformed infrastructures in relation to the concept of *anticipatory governance*, and, specifically, how this facilitates conditions whereby the leadership gaze is directed to future visions of school improvement. However, these imagined futures are also a product of the current contexts in which they are formed. Therefore, there is also a need to attend to the spatio-temporality around the policy logics that operate within the platformed infrastructures and how these shape leadership conditions. I argue that this requires a recognition and interrogation of the data hygiene practices that are at work therein, with such practices producing *laundered* representations of school performance.

[41] The term *part* is used here to emphasise both the dynamic nature of the platformed infrastructures being explored, as well as the entanglement of researcher, whereby the processes for the selection for materials also constitute the methodological consequences around doing research of this nature.

6.2 Making time in platformed infrastructures

To begin with, temporality is another of those slippery concepts that can and does hold multiple meanings depending on the context in which it is deployed. It is often used interchangeably with time, which can be problematic, since time is primarily considered as a device of measurement and calculation (Oxford Reference, 2025). While there is certainly a connection with time, temporality is more concerned with 'time insofar as it manifests itself in human existence' (Hoy, 2009, p. xiii). That is, temporality is a highly relational endeavour, not as something that simply exists out there, but rather as something experiential that is brought into being via an arrangement of complex mechanisms. It also highlights relational becomings, where the 'world is not something within which time takes place; there are flows of time from which worlds are perceived' (Colebrook, 2002a, p. 42). This framing emphasises the pivotal role of temporality in our perceptive sense of the world.

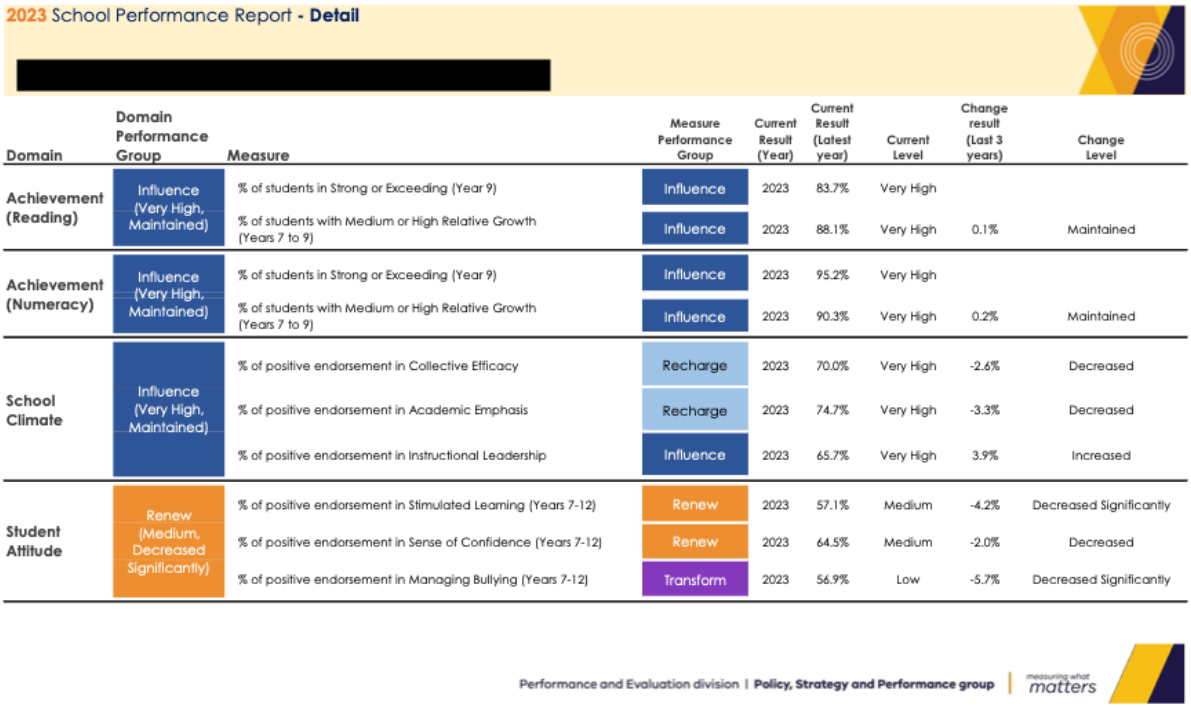
Deleuze considers the viewing of temporality as both a synchronous and diachronic endeavour (Hoy, 2009, p. 218). That is, there are 'two simultaneous readings of time' (Deleuze, 1990, p. 5) that complement one another, in which the living present (*chronos*) and the infinite stretch of time (*aion*) are considered in tandem as a 'dual temporalisation' (Hoy, 2009, p. 218). Such a process contains two core actions:

> First, it must be grasped entirely as the living present in bodies which act and are acted upon. Second, it must be grasped entirely as an entity infinitely divisible into past and future, and into the incorporeal effects which result from bodies, their actions and their passions. *Only the present exists in time and gathers together or absorbs the past and future*. But only the past and future inhere in time and divide each present infinitely. (Deleuze, 1990, p. 5; emphasis added)

Such a conceptualisation of 'present' understands the contemporary moment as a relational experience *between* past and future. It is these practices of present-making that are the first site of analysis within this chapter.

In the Victorian context, the *School Performance Report* is an example of a time stasis in which conceptualisations of the 'present' are both fixed and contentious. That is, it documents a current datafied version of a school's 'present' performance in a static format, unlike the dynamic data dashboards on the platforms which are consistently changing and updating. However, what constitutes 'present' performance in terms of the data representations can vary. The School Performance Report is generated annually in Term 4 by the Department (specifically by the

Performance and Evaluation Division team)[42] and provides an overview about how well the school has performed compared to all other government schools in the state on a set of student outcome measures (DET, 2024g). In this report, schools are also allocated to a performance group according to the Differentiated Schools Performance Method (DSPM) and are encouraged to use the report to support their strategic planning by 'identifying key areas for improvement' (DET, 2024g, n.p.). *Figure 6.2* shows a sample page from a deidentified school performance report.



2023 School Performance Report - **Detail**

[redacted]

Domain	Domain Performance Group	Measure	Measure Performance Group	Current Result (Year)	Current Result (Latest year)	Current Level	Change result (Last 3 years)	Change Level
Achievement (Reading)	Influence (Very High, Maintained)	% of students in Strong or Exceeding (Year 9)	Influence	2023	83.7%	Very High		
		% of students with Medium or High Relative Growth (Years 7 to 9)	Influence	2023	88.1%	Very High	0.1%	Maintained
Achievement (Numeracy)	Influence (Very High, Maintained)	% of students in Strong or Exceeding (Year 9)	Influence	2023	95.2%	Very High		
		% of students with Medium or High Relative Growth (Years 7 to 9)	Influence	2023	90.3%	Very High	0.2%	Maintained
School Climate	Influence (Very High, Maintained)	% of positive endorsement in Collective Efficacy	Recharge	2023	70.0%	Very High	-2.6%	Decreased
		% of positive endorsement in Academic Emphasis	Recharge	2023	74.7%	Very High	-3.3%	Decreased
		% of positive endorsement in Instructional Leadership	Influence	2023	65.7%	Very High	3.9%	Increased
Student Attitude	Renew (Medium, Decreased Significantly)	% of positive endorsement in Stimulated Learning (Years 7-12)	Renew	2023	57.1%	Medium	-4.2%	Decreased Significantly
		% of positive endorsement in Sense of Confidence (Years 7-12)	Renew	2023	64.5%	Medium	-2.0%	Decreased
		% of positive endorsement in Managing Bullying (Years 7-12)	Transform	2023	56.9%	Low	-5.7%	Decreased Significantly

Performance and Evaluation division | **Policy, Strategy and Performance group** | measuring what matters

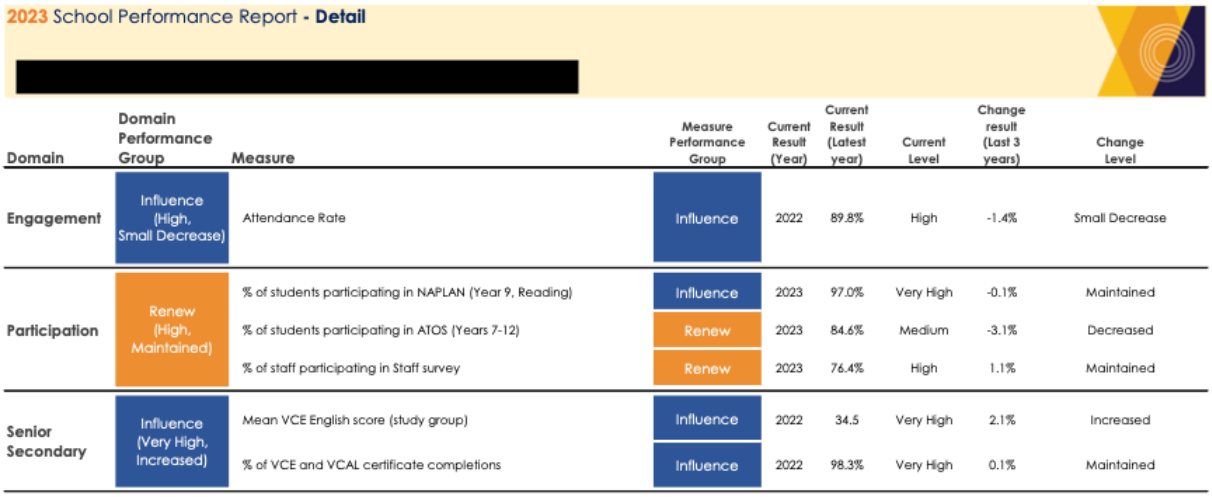
Figure 6.2: A sample page from a deidentified School Performance Report.

While school performance reports are seemingly representative of the school's performance at the current moment in time (specifically against the key State Education targets and objectives), the notion of what constitutes the 'present' is, at times, problematic. For example, NAPLAN is conducted on an annual basis and is thereby reported on once per year in these reports as well as within the dashboard representations in Panorama. We can assume that over the duration of a year, this performance will not remain static, given that learning is continuously happening in the school site. However, it does remain static in these representations because there is no movement of the data until the next 'data drop', whereby a new data set is entered into the system

[42] Interestingly, School Performance Reports prior to 2024 hold no overt reference to Panorama, while those from 2024 onwards are specifically labelled as Panorama School Performance Reports.

(i.e., next year's NAPLAN data). Thus, what is being presented to schools in Term 4 (i.e. from September onwards) within their performance report may well show the 'present' state of learning in the context of the latest NAPLAN data (collected in March). However, this report does not necessarily reflect a school's 'current' performance given that much of the data is collected at various points throughout the year, rendering what happens in the 'in-between' time as presently invalid.

On the other hand, the dashboards within Panorama form another version of the present moment. Attendance data, for example, is collected by schools daily. This is also updated daily to the Panorama system, meaning that the dashboard displays pertaining to 'current' attendance data are from a much more recent timeframe. Yet, this data is still presented as a static 'current result' within the school performance report, and one that is based on data collated in the previous year (assumedly to provide an annual baseline for attendance of the school year). This can be seen in *Figure 6.3* which shows that for some domains in a 2023 School Performance Report, the 'current result' is based on data gathered in the same (or current) year as the report (i.e., Participation) as well as data gathered in the year prior (i.e., Engagement). This would assumedly pose problems for principals; they are being encouraged to use their performance report to assist with strategic planning, but these reports are not reflective of the 'real-time' data available within the platform.



2023 School Performance Report - **Detail**

[redacted]

Domain	Domain Performance Group	Measure	Measure Performance Group	Current Result (Year)	Current Result (Latest year)	Current Level	Change result (Last 3 years)	Change Level
Engagement	Influence (High, Small Decrease)	Attendance Rate	Influence	2022	89.8%	High	-1.4%	Small Decrease
Participation	Renew (High, Maintained)	% of students participating in NAPLAN (Year 9, Reading)	Influence	2023	97.0%	Very High	-0.1%	Maintained
		% of students participating in ATOS (Years 7-12)	Renew	2023	84.6%	Medium	-3.1%	Decreased
		% of staff participating in Staff survey	Renew	2023	76.4%	High	1.1%	Maintained
Senior Secondary	Influence (Very High, Increased)	Mean VCE English score (study group)	Influence	2022	34.5	Very High	2.1%	Increased
		% of VCE and VCAL certificate completions	Influence	2022	98.3%	Very High	0.1%	Maintained

Figure 6.3: A sample page from a deidentified School Performance Report showing the contrast in 'current results' between Domains.

We can see the juxtaposition of timing here in that the present can be considered as quite a lengthy space of time (i.e., NAPLAN annual data) and, at the same time, a relatively short space of time (i.e., daily attendance data). This creates conditions for school leaders whereby their work

is predicated on the 'timeliness' of things, including when certain data sets become available and how and when they can respond to them in a timely manner. The Panorama dashboards, for example, convey 'real-time' measures of a school's current performance, and yet the notion of 'real-time' is problematic, given the timeliness around particular data drops (NAPLAN versus attendance). The present and the experience of the immediate is thus both recent *and* reaching into the past.

Similarly, in the New South Wales context, we can see how the 'present' is being produced within the platform through the dashboard representations. Timesaving is a key rationale behind the development of the Scout platform. In an introductory video, Scout is credited for this time-saving capacity: 'Scout removes the *time-consuming* task of locating, collecting, and compiling data, leaving you to concentrate on delivering quality learning and leadership' (DoE, 2019 - transcript). Yet what constitutes 'present' school performance remains contested for school leaders based on the configurations of these representations. Scout, like Panorama, features a key dashboard display. The main section of the display provides what is described as a 'quick snapshot' of the school, with some selective data representations relating to student performance[43], attendance and wellbeing and other contextual information (pertaining to enrolment-related information, such as Aboriginal students, EAL/D[44] and FOEI[45]) (see *Figure 6.4*). Again, as with both the School Performance Reports and Panorama dashboards in the Victorian context, this snapshot in Scout is coupled with present time, insofar as it provides a 'visual overview of the *current position* regarding benchmarks and school target indicators for a selected school' (DoE, 2023a; emphasis added). As with the Victorian context, we can see multiple references to various time periods in this 'current' display of performance. There are a number of 'as of' dates indicating the recency of the data; for example, the student performance data (i.e., NAPLAN results) is presented 'As Of: 31 Dec 2019' (*Figure 6.4*), while the wellbeing data (i.e., TTFM[46] survey results) is presented 'As Of: 19 Oct 2020' (*Figure 6.4*). As in the Victorian context, a school's

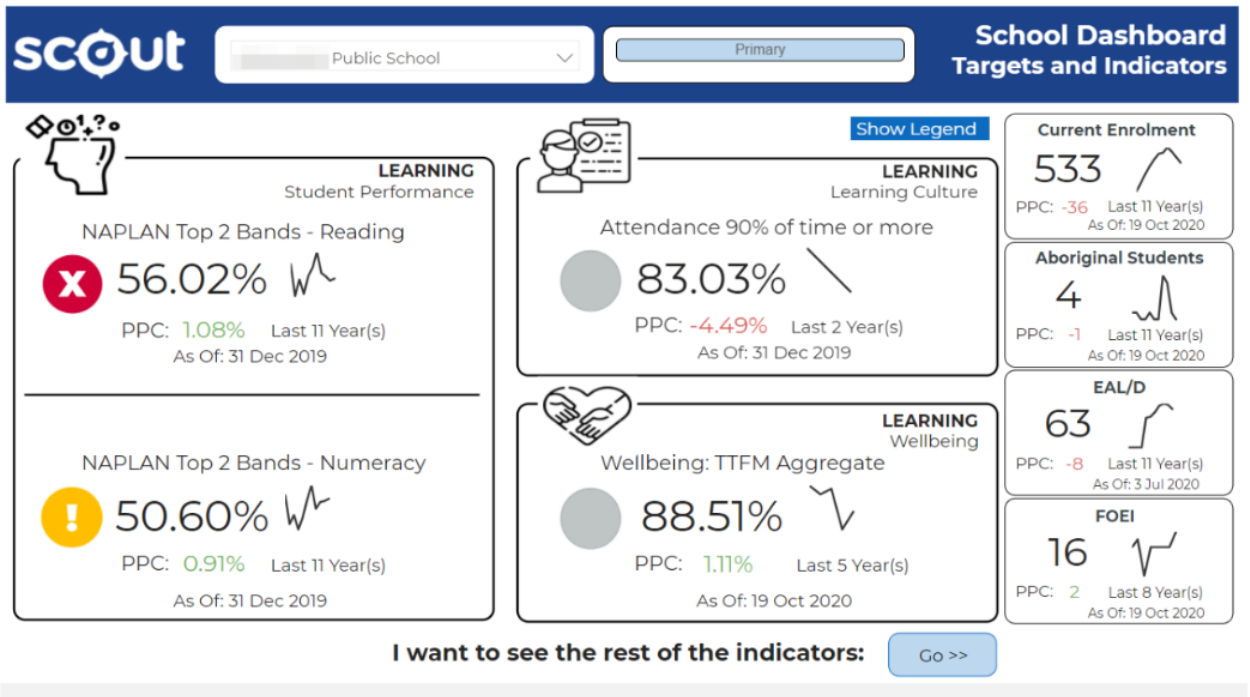
[43] Note here, that the category of Student Performance is referenced only in relation to student performance in the Top 2 bands of NAPLAN here in Reading and Numeracy.

[44] English as an additional language or dialect.

[45] Family Occupation and Education Index, the socio-economic indexing measure used by the New South Wales Department of Education (Centre for Education Statistics and Evaluation (CESE), 2013).

[46] *Tell Them From Me (TTFM)* is an online survey administered to students, parents and teachers within the NSW schooling system to capture datafied information about wellbeing, engagement and general attitudes towards individual schools.

'current' performance is generated based on a number of data points gathered across different time periods.



School Dashboard report in Scout

Figure 6.4: A sample of the overview display within Scout's School Dashboard (DoE, 2023a).

What is interesting here are the multiple references to time, and how these all produce a temporality around the school's performance in the 'current' moment. In the following figure (see *Figure 6.5*), which takes an up-close look at just one of the dashboard subsections in *Figure 6.4*, we can see how a range of time-spaces have been condensed into a single dashboard representation of student learning performance. These are 'current' values in the form of a percentage, a Prior Period Comparison, or PPC, (which is also displayed as a positive green or negative red integer to indicate increased or decreased performance), an outlined trend analysis period accompanied by a line graph representation, and a date indicating the last time the data set was updated. Here, within a singular space on the platform, the current datafied moment is seen as an amalgamation of previous data sets from a pre-selected period of time as they relate to the most recent data set in practice. This prompts a critical question involving what constitutes the present when it is diametrically opposed in a singular space; where the present is both fleeting *and* static, or where the present is both today (as per daily updated attendance rates) *and* a year earlier (as per annually updated data sets, like NAPLAN). As Hoy (2009) notes, the present is a pertinent conundrum in philosophical thought: 'is it just an infinitesimal blip between the past and the future' (p. xvi), or is it, in fact, something more, which extends back somewhere between a year and day.

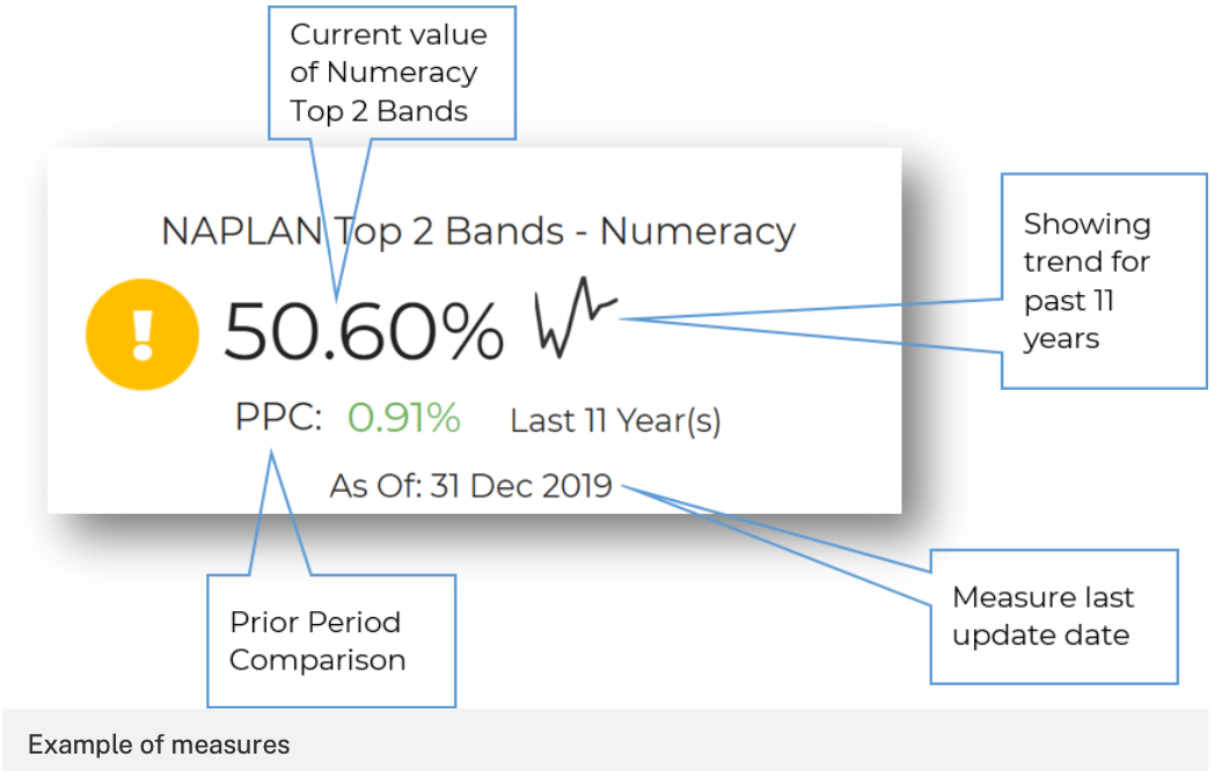


Figure 6.5: A figure showing the example of measures used in a single point of data representation (DoE, 2023a).

Measuring 'present' or 'current' school performances features heavily as a common discourse for both Panorama and Scout and their associated infrastructures. However, it is important to consider the present as a largely contingent notion as what constitutes a present moment in time relevant to school performance is produced *within* and *by* the platformed infrastructures. As we see in both Panorama and Scout, static reports or displays are a key feature for ascertaining the 'present' or 'current' status of a school's performance; however, their status as 'current' is entirely dependent on the broader spatio-temporal conditions surrounding the individual data sets. This means that 'current' performance can be related to data gathered both yesterday (via attendance records) or up to a year ago (via NAPLAN results), elongating what is considered as the 'present'. Nonetheless, the 'present' remains a key locus for users of the platformed infrastructure to anticipate and act on the future ahead.

6.3 Anticipating time

While the previous section problematised the development of 'present' understandings of school performance within the platformed infrastructures, it is also important to consider how this relates to the future. As discussed, the platform both reinforces and disrupts conventional perceptions of

time, which has implications for how one can conceive of the present moment. We see examples of chronological time embedded within the visual representations of both Panorama and Scout's dashboards, which emphasise its importance and relevance for constructing school performance. Such 'chrono-logics' (Webb et al., 2020) form an important impetus for considering the future in the form of organisational strategic planning as a core part of leadership work. For schools in both the Victorian and New South Wales contexts, this involves enacting Department-prescribed school improvement agendas. Such agendas encompass critically examining both past and present performance measures and subsequently using the information to inform future trajectories for strategic intervention, and, subsequently, improved performance.

Kitchin (2023) explains how through practices of governance in the datafied environment, the past and future are shaped in present time through algorithmic means; that is, the present entails frequent looking backwards and looking forwards through technocratic lenses imbued in algorithmic processes. We can see this, for example, in the DSPM algorithm used within the school performance report (discussed in the previous section, section 6.2) to generate school performance categories in the Victorian context. As explained in Chapter 5 (section 5.5), current data measures in different learning domains are calculated against previous results to provide schools with an overall category to describe their performance in the current year. These categorisations drive 'continuous improvement' (DET, 2019, p. 3) as policy outlines how the this performance report (and thereby, the algorithmically-generated categories) are provided to 'support the development of their next annual implementation plan' (DET, 2024g, n.p.).

Such future-oriented thinking relative to past and present understandings is more commonly understood as *anticipatory governance* (Gulson et al., 2022; Webb et al., 2020). Anticipatory governance refers specifically to the governance of educational futures that are predicted through trend analysis of past and present data. While governance has always sought to predict possible futures and thereby mitigate potential threats (Kitchin, 2023), the increasing levels of datafication and automation have amplified this due to the vast amount of data at a system's disposal (Webb et al., 2020). Such vast amounts of data available to organisations, including schools and their broader departments of education, encourage something being done with the data. For instance, if leaders can 'see' a specific trajectory unfolding over time, then they can presumably then intervene in the present moment to discourage certain undesirable futures; for instance, using collected attendance data to identify a student at-risk of disengaging from their learning and intervening accordingly. Such a logic prioritises systemic efficiency, in which smaller anticipatory actions can be made in a timely manner to prevent the need for larger inventions. In such an arrangement, the future is transported into the present, ultimately 'shaping how the present

unfolds in order to realise an aspirational future' (Kitchin, 2023, p. 93), creating conditions whereby school leaders are constantly navigating this temporal terrain.

School leaders are operating in conditions where anticipatory governance features heavily as a core part of their work. In the Victorian context, school leadership teams are required to undertake school reviews every four years to evaluate their progress on their previously developed strategic goals (DET, 2024h). Such evaluation, which includes the school performance reports and other data representations from Panorama's dashboards, is then used to develop the next iteration of the school's Strategic Planning Document (SSP) that will see them through until their next school review in four years' time (DET, 2023b). Such a process is essential to the school's ongoing registration through the Victorian Registration and Qualifications Authority (VRQA), the statutory authority tasked with mitigating or minimising potential harms in educational settings across the state (VRQA, 2023, p. 5).

At the commencement of the school review process, schools are asked to undertake a 'pre-review self-evaluation' (PRSE) within the SPOT platform. This process requires schools to 'undertake a comprehensive analysis of student learning and wellbeing outcomes' (DET, 2024h, n.p.) against the 'FISO 2.0 continua of practice', a rubric designed to support the self-evaluation process. Schools are expected to show evidence to support their self-evaluations across the core areas of FISO, and are provided with a list of recommended data sources to be explored, with Panorama's dashboards and static reports topping the list (DET, 2024h). This is also supported with a document outlining the Department's 'evidence-based system measures' which are aligned to the two key FISO outcomes (learning, wellbeing) and the five core FISO elements (leadership, teaching and learning, assessment, engagement, support and resources) (DET, 2021a). *Figure 6.6* shows a tabular overview of the recommended system measures, all of which are available as representations within Panorama. Here, there is a subvert expectation provided by policy to engage in both past and present representations of the school's performance as displayed within and by Panorama.

FISO 2.0 Outcomes	
Learning	**Wellbeing**
Benchmark growth (NAPLAN)	Resilience (AtoSS)
English online	School connectedness (AtoSS)
Senior secondary completion rate	Subjective physical health (AtoSS)
	Emotional awareness and regulation (AtoSS)
	Strengths and Difficulties Questionnaire (SEHQ, prep only)

FISO 2.0 Core elements				
Leadership	**Teaching and learning**	**Assessment**	**Engagement**	**Support and resources**
Instructional leadership (SSS)	TJ growth (CASES)	Monitoring effectiveness of using data (SSS)	Attitudes to attendance (AtoSS)	Advocate at school (AtoSS)
Trust in colleagues (SSS)	Collective efficacy (SSS)	Moderation of student assessment (SSS)	Proportion of students with less than 20 absent days (CASES)	Experience of bullying (AtoSS)
Managing bullying (AtoSS)	Academic emphasis (SSS)	Understand formative assessment (SSS)	Sense of confidence (AtoSS)	Respect for diversity (AtoSS)
	Guaranteed and viable curriculum (secondary) (SSS)	Use of student feedback to inform teaching practice (SSS)	Student voice and agency (AtoSS)	
	Stimulated learning (AtoSS)			

Figure 6.6: A table outlining the recommended evidence sources for completing the PRSE (DET, 2021b, p. 2).

Similarly, in the New South Wales context, a four-yearly external validation process forms the basis for strategic improvement in all government schools (DoE, 2024c). It is clearly expressed that 'external validation is not an inspection' (DoE, 2024b, p. 5), but rather an 'opportunity' for schools to discuss evidence of their practice performance with a 'panel of peers' (DoE, 2024b, p. 5). This is aligned with the School Excellence cycle (DoE, 2024c) in a similar manner to FISO 2.0 in the Victorian context, whereby a Strategic Improvement Plan (SIP) is developed from the external validation to identify three strategic directions for future school improvement. As within the Victorian context, the New South Wales process commences with a situational analysis which is an 'authentic and rigorous assessment of a school's current state' (DoE, 2024c, n.p.) designed to help schools prioritise future areas for performance growth. Again, leaders are directed to the School Dashboard in Scout to complete this task, as it provides school with a 'snapshot' of the five key focus areas (wellbeing, student performance, human resources, finance, enrolment' (DoE, 2024c).

At the conclusion of each of these review processes across both the New South Wales and the Victorian contexts, four-year strategic plans are developed and then operationalised via annual implementation plans. These plans are then assessed in terms of their success at the end of each

year via school annual reports; it is mandated that these be published on all individual school websites for community engagement. A key point associated with these practices is the push for school leaders to anticipate future outcomes based on their previous (datafied) school performance records. Here, the future has a largely utopian function (Luhmann, 1976), insofar that it tries to rationalise choices for present actions based on system- and site-level negotiated anticipatory outcomes.

6.4 Towards the 'horizon' of improvement

While school improvement agendas have arguably always formed a part of the core work of principals and leaders, the temporal conditions around this have been exacerbated by the '3Vs' of Big Data (specifically, *volume*, *velocity* and *variety*) (Kitchin, 2014). The location of this leadership work has also fundamentally shifted to being enacted within an online, platformed space, as opposed to the discrete school site. In New South Wales, the school improvement work occurs within the School Planning and Reporting Online (SPaRO) platform; in Victoria, it occurs in the Strategic Planning Online Tool (SPOT). Each of these platforms are connected to their respective data counterparts (namely, Panorama and Scout) through interoperability mechanisms to enable systemic data flows within a broader data infrastructure (Lewis & Hartong, 2022). As outlined in Chapter 5, such mechanisms include data that can translate across various systems (e.g., NAPLAN data measures across state/territory departments of education) and platforms (e.g., the pulling of data from Panorama to SPOT to auto-populate school improvement and reporting documents).

Such mechanisms also influence the type of temporalities that are possible within these platformed infrastructures, creating timelines for completion that can be flagged as in- or mis-complete for the purposes of streamlining systemic operations. Shifting the site of these practices to an online digital space also shifts the site of such anticipatory work and directs thinking to a future that needs to be imagined in such a way that there is potential for it to be reached. That is, educational leaders need to consider strategic visions that are likely and/or able to be achieved, based on the contextual factors of their school. In the Victorian context, strategic visions developed in SPOT are accompanied by targets that represent a measure of achievement of a specific goal (DET, 2024g). Such targets are developed in negotiation with the review panel as part of the four-yearly school review process and form a vision, or imagined future, of what the school hopes to achieve throughout the life of their SSP. During the initial evaluation conducted throughout the PRSE (explained in the previous section, section 6.3), school leaders reflect on their performance against the previous SSP and categorise previous goals and targets as having

been met, partially met, not met, no longer relevant or not able to be assessed (DET, 2024h). In this way, school leaders are encouraged to be future focused but are also held to account for their current performance.

Returning briefly to the problematics of what constitutes present time, we can find a similar conundrum trying to establish a temporal future for school leaders to look towards to guide their continual improvement agendas. Chronological conceptions of time imply 'the future will begin where the present ends' (Luhmann, 1976, p. 138), rendering the present as a locus of action as opposed to a specifically named time-space. Put differently, there is an expectation that we can definitively point to neatly defined boundaries around what constitutes past, present and future time modalities, however this also renders these periods as static entities rather than the active time-spaces that they are. Such logics reflect the 'ongoing redemptive aspirations of policy' (Lingard, 2021, p. 345), in that policy continues to imagine a future that is better than current iterations.

Luhmann's (1976) conceptualisation of the 'temporal horizon' is useful here to ascribe the act of anticipatory governance as more powerful than the concrete projections themselves. Luhmann (1976) explains that:

> …the essential characteristic of a horizon is that we can never touch it, never get at it, never surpass it, but that in spite of that, it contributes to the definition of the situation. Any movement and any operation of thought only shifts the guiding horizon but never attains it. (Luhmann, 1976, p. 140)

Thus, future-oriented thinking, much like the horizon, while unattainable, still serves an important guiding purpose for present-moment thinking. In both the New South Wales and Victorian contexts, the SSPs/SIPs contain what could be considered as these horizon-like aspirations. Examples of these goals include succinct goals in the Victorian SIPs, such as 'to improve student outcomes in Literacy and Numeracy', 'to develop a high functioning and positive learning community' (both goals have been cited from sourced SIPs – school names redacted to maintain anonymity), or more lengthy statements of purpose in the New South Wales context, such as:

> To ensure every student is both engaged and challenged in their learning, we will build the capabilities and understandings of teachers, students and parents in the areas of visible learning and collaborative practice. The School Excellence Framework themes of differentiation, lesson planning, feedback and collaborative practice and feedback will drive improvement and provide measures for success. (Strategic Improvement Plan from a NSW school – details withheld to maintain anonymity)

While the final wording of these goals/purposes alters depending on individual context, as well as state context, a commonality across both Victoria and New South Wales SIP documentation is that these goals serve to direct focus towards the future.

Not only do schools anticipate their future in terms of a qualitative aspirational goal, but they are also required to anticipate the future through the development of targeted measures[47] to indicate success. In New South Wales, there is a distinct variation between the types of improvement measures listed in these plans, from those that are specifically relevant to data sets available within Scout (i.e., 'Improvement in the percentage of the students achieving in the top 2 bands to be above the lower bound system negotiated target in Reading of 63.7%'), to those that are set around enacting a specific action (i.e., 'All teachers are involved in using Teaching Sprints approach in collaborative learning communities for monitoring student learning in literacy and numeracy'). However, within another section of these reports where schools are asked to complete an 'Evaluation plan for this strategic direction', the majority refer to Scout specifically, or data sets available in Scout, as part of this plan.

In the Victorian SSPs, the presence of the platformed infrastructure is more strongly felt through discourses of developed targets. Analysis of a sample (n = 73) of Victorian SIPs revealed that *all* schools within the sample had quantified targets relating to measures available within the Panorama platform. Goals generally referred to multiple data sets in their own distinct targets, arguably as a way of demonstrating a multi-level approach to understanding improvement measures. An example of this has been presented in the following table (see *Table 6.1*):

Goal 2	**Improve student outcomes in Numeracy**
Target 2.1	By 2023, the three-year average percentage for students in the top two NAPLAN bands will increase to: Numeracy • Year 3: 37% (2019)—43% (2023) • Year 5: 30% (2019)—43% (2023)
Target 2.2	By 2023, the percentage of students meeting or above NAPLAN benchmark growth will increase to: • Numeracy: 87% (2019)—92% (2023)

[47] Referred to as 'Targets' in the Victorian context, and 'Improvement measures' in the New South Wales context.

Target 2.3	By 2023, the percentage of positive endorsement for the following SSS[48] factors will increase to: • Teacher collaboration: 64% (2019)—80% (2023) • Understand how to analyse data: 63% (2019)—80% (2023) • Believe peer feedback improves practice: 42% (2019)—80% (2023)

Table 6.1: An example of a goal and related targets from a de-identified Victorian SIP.

Here, we can see examples of core data sets collated and aggregated in Panorama being used to create an anticipated future, a proverbial horizon to direct everyone's attention towards. However, it is also important to consider this vision as one that has been reduced down and simplified according to the current context of school performance. If we indeed 'experience our future as a generalized horizon of surplus possibilities that have to be reduced as we approach them' (Luhmann, 1976, p. 141), then the platformed infrastructures also contain functions that serve this reductive process. The next section examines this core reductive function in light of the concept of 'data hygiene' (Mulvin, 2021) as a way of considering the temporality around the platformed infrastructures.

6.5 Temporal practices of data 'cleanliness'

As mentioned in the previous chapter, since the establishment of the 'education revolution' which shifted the locus of educational improvement towards a nationalised agenda (Savage, 2021b), a range of data platforms have popped up across the states and territories to provide schools with a specific subset of information pertaining to their performance. While a number of studies have attended to the development of these platforms and their infrastructuring processes in the Australian context (see, for example, Clutterbuck et al., 2023; Pangrazio et al., 2023) and internationally (see, for example, Lewis & Hartong, 2022), I seek here to focus on the platformed infrastructures around Panorama and Scout as spatio-temporal sites: 'clean', 'laundered' representations of how schools are faring comparatively in their performances. Much like how all policy 'sits in a particular milieu' (Lingard, 2021, p. 348), that is, its own time-space, so too do the platformed infrastructures. Data hygiene (Mulvin, 2021) becomes a mechanism for considering the temporality around the platformed infrastructures.

Hygiene becomes the way to bring order to previously disordered content, creating matter that is 'cleaner' and thereby more trustworthy (Mulvin, 2021). Hygiene implies a particular

[48] School Staff Survey, administered annually by Victorian government schools to collect feedback from staff members (DET, 2023a).

standard, or a shared benchmark; a fixed point through which comparison is made possible. We saw this play out throughout the COVID-19 pandemic; a collective notion of 'hygiene' was curated and provided to the public for them to stay safe and clean infection. Signs and instructions showing how to correctly wash your hands; sanitising stations everywhere; masks of differing degrees of effectiveness, and so on. All of these created a standardised notion of cleanliness that would protect us from the virus; a standardisation deeply entangled in a particular cultural and socio-political context. Data hygiene therefore 'illuminate[s] the labour of maintaining proxies, data, and knowledge infrastructures' (Mulvin, 2021, p. 69). It considers the practices involved in developing and maintaining the individual platforms and the representations that they produce and, equally importantly, it also identifies these practices as deeply engrained in the current context.

Arguably, platforms like Panorama and Scout perform a critical service in the broader infrastructures of national data collection and collation; serving as data 'launderers' that take the messy and complex realities of school and 'clean' them up so that they are able to be understood in specific ways. We see this through the algorithmic functions behind the platforms themselves, where points of data (including measurements of performance, opinion, attendance, etc.) are curated into specific images within the dashboard displays. Taking up student attendance again as a point of comparison across the two platformed infrastructures, we can examine how both platforms present dashboards displaying an overall depiction of attendance 'performance' within their schools. On the Scout dashboard (see *Figure 6.7*), attendance is visually demonstrated in a number of ways, including an overall percentage of attendance relative to the whole school and how this compares to the state and network averages. Also present in this dashboard is a measure for students attending school 90% of the time, implying that this is an important benchmark for schools to consider. We can see a similar benchmark representation in the Panorama absences dashboard (see *Figure 6.8*), with the data filter set to measure the percentage of students with twenty plus absent days. Coupled with the visual bar graph representation, this rate of absence (represented by the grey colour) falls visually 'below the line', implying that there is a standard representation of attendance for students.

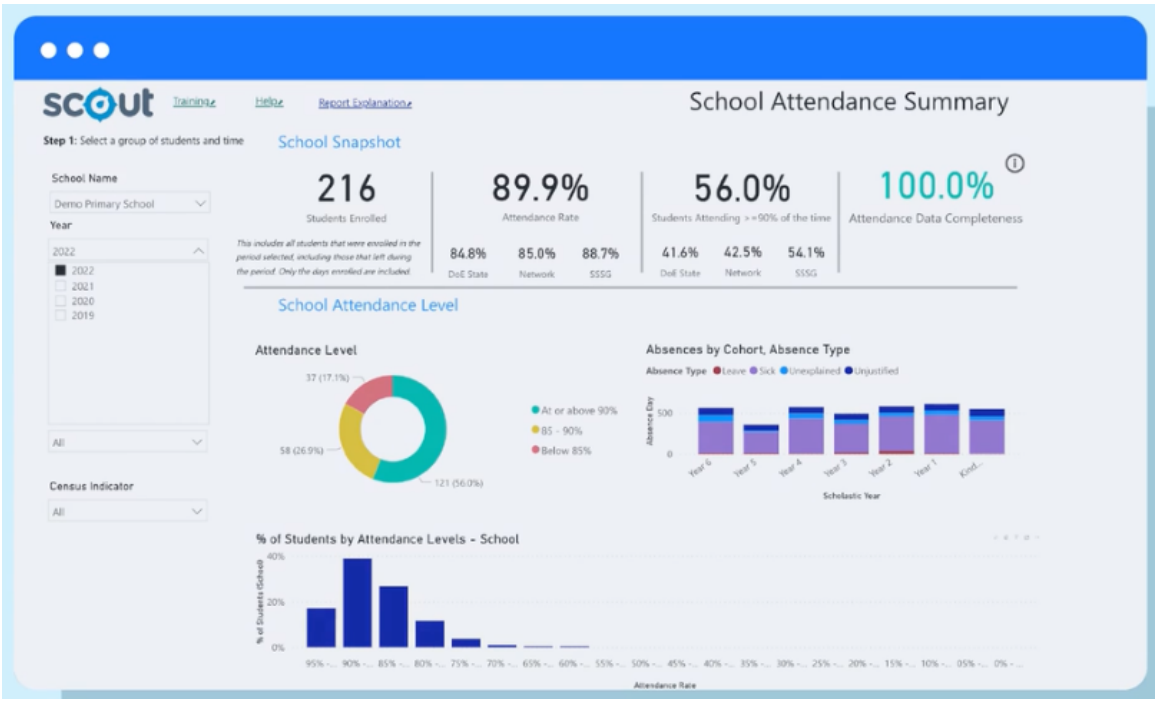


Figure 6.7: A screenshot from a demonstration video of the school attendance summary dashboard page within the Scout Attendance and Engagement App (DoE, 2023b).

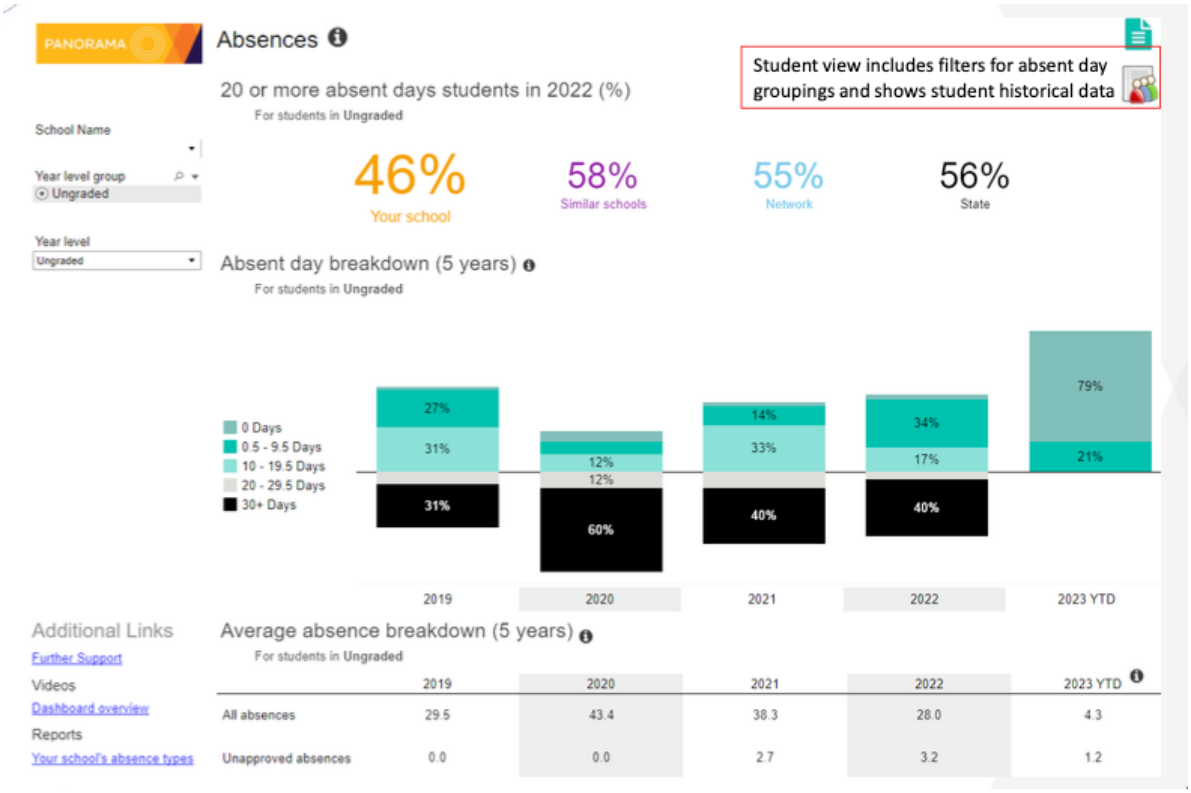


Figure 6.8: A screenshot from a PowerPoint training presentation showing a view of a typical Panorama dashboard that focuses on student absences (DET, 2017b).

Each of these dashboards show what Mulvin (2021) would consider to be a 'clean' version of the data that is both 'commensurable and usable' (Mulvin, 2021, p. 41) in the context of school improvement agendas. There is a distinct standard that is produced through these practices of data hygiene; namely, that student attendance should be above 90% (in NSW), or that students should have fewer than 20 absence days throughout the school year (in VIC). However, there is also an inherent assumption here that 'we know and agree on what constitutes the extraneous or erroneous information that needs cleansing' (Mulvin, 2021, p. 41), for ideas of data cleanliness are, as previously mentioned, deeply entwined with temporality in that they are expressive of a particular period. That is, these dashboard representations are reflective of the broader conditions in which leaders are encouraged to view their students. In Scout, the students who fall into the attendance category of below 85% are graphically displayed in red. In the graphical display on the Panorama dashboard, two categories sit above a line (less than 19.5 days absent) while the other two sit below (20+ days absent). Both of these create benchmark standards for viewing and categorising students that are relative to the present context of educational performance. It is in this understanding that we can reconnect with temporality as being 'produced, articulated and experienced' (Kitchin, 2023, p. 4) in such a way that it both affects, and is affected by, the platformed infrastructures. In much of the same way that the groundless ground is contingent on us not questioning it too extensively, 'clean data proxies' like those found in the visual representations 'have to be taken for granted' (Mulvin, 2021, p. 53).

In both the Victorian and New South Wales contexts, we can see a distinct coupling of student attendance as evidence of engagement in learning, albeit in slightly different ways. In New South Wales, student engagement is referred to as 'the extent to which students identify with and value schooling outcomes and participate in academic and non-academic school activities' (DoE, 2023b). The Department acknowledge the difficulty in measuring engagement given that there are multiple definitions and measures of this that depend on the context (DoE, 2023b). They do state that student self-report instruments, such as the TTFM survey, are the most utilised measures due to their effectiveness in capturing engagement across different spectrums (DoE, 2023b). However, student engagement is not listed as a key measure in New South Wales' Scout dashboard, but rather attendance is coupled with the concept of 'Learning Culture' (as depicted in *Figure 6.4*). In the Victorian context, however, we see a more explicit coupling within the Differentiated Schools Performance Method (DSPM) where, as discussed in section 6.3, the method for calculating student engagement is predicated on just a single data source - attendance. Here, a standard is created around the data sets and their representations; conditions of what constitutes accessible data representations are formed in this contextual time-space.

Further to this, the DSPM itself is an example of the laundering processes of 'cleaning' the data. Here, the DSPM as an algorithm essentially takes the aggregated data sets within Panorama, and cleans them up even further, assigning schools to one of five performance groups across six key domains, as well as providing an overall performance measure. Here, potentially erroneous information (i.e., specific points of data) are removed in a cleaning process that assigns schools to a defined standard of performance. These performance groups are also entwined within discourses of time, whereby performance over a selected period of time is used as a yardstick by which to measure the 'current' performance of the school (see *Figure 6.9*). Considering the standard of hygiene around this is, again, important to understand how schools can be assigned a performance category that is only relevant in relation to the broader conditions surrounding it. For example, what constitutes performance that is in the 'Influence' category is one where the aggregated data sets reflect an improvement trajectory over time. Here, the practices of data hygiene within Panorama are entangled in cultural and socio-political contexts laden with hidden privileges and conditions of possibility, creating a 'theatre of objectivity' (Mulvin, 2021, p. 71).

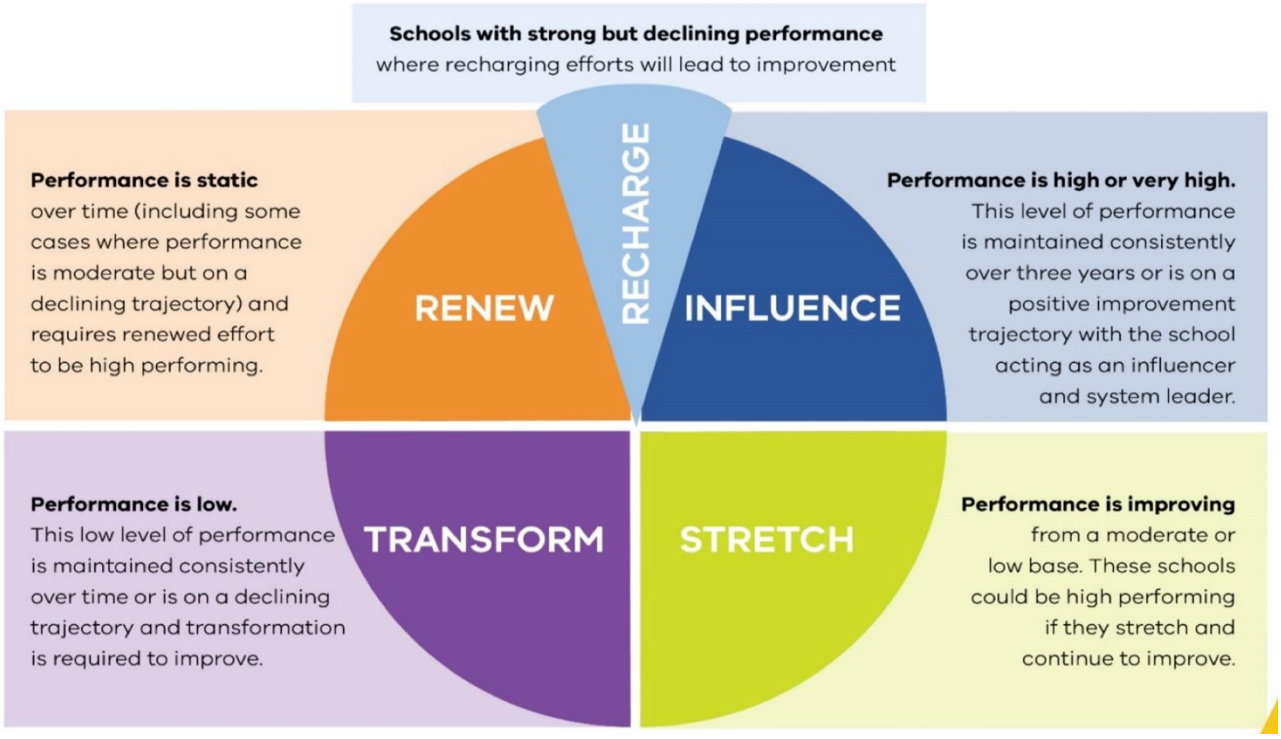


Figure 6.9: The Differentiated Schools Performance Groups and their definitions (DET, 2021b).

School annual reporting documents are also indicative of the laundering practices evident in the platformed infrastructures. In addition to informing the DSPM, the data from Panorama is used in schools' *Annual Report to the School Community*, a primary document generated annually as part of the school's reflective process for determining strategic improvement (discussed in

Chapter 5, section 5.6). It is a legislative requirement of all Victorian government schools to publish this report on the Victorian Registration and Qualifications Authority (VRQA) State Register; they are also encouraged to publish this report on their school websites as a mechanism for community distribution (see DET, 2023b). As explained in Chapter 5, while the first part of this report allows schools to provide some qualitative detail about their school and overall performance, the second part of the report is a computer generated 'Performance Summary', which purportedly provides stakeholders with a succinct overview of how the school both contributes to Education State priorities and compares with other Victorian government schools. Not only is there a deferring of expertise here whereby the algorithms within the associated platforms of Panorama and SPOT work to produce this report on behalf of the leader, we also see an example here of another laundered representation of school performance.

This type of 'snapshot summary' of performance is common across both contexts as we saw earlier with the example of Scout's Dashboard overview. By condensing such a vast amount of information via algorithmic means, the platform serves as a data launderer, taking the complex world of schools and cleaning them up for easier consumption. However, it is crucial to remember that there is a temporality around processes of data cleaning; what constitutes 'clean' data and the standards by which this is measured is always influenced by cultural, social, political and geographical factors. That is, standardised measures of data change over time, but as stated in Chapter 5, they all age a present ground on which they are formed and of which they also give rise to. But what do schools and their broader systems do with these laundered knowings? I now show how the platformed infrastructures produce conditions that encourage, or 'nudge' school leaders to adopt specific strategic directions in line with these laundered representations.

6.6 Temporal 'nudging'

While policy and documentation pertaining to these platformed infrastructures do not specifically mandate the use of Panorama and Scout in the everyday work of the school leader, there are certainly techniques being deployed that overtly and covertly encourage their use without the need for mandatory policy measures. In this way, mechanisms of governance seek to 'steer at a distance' (Brown, 2021), giving schools and their leaders the illusion of heightened autonomy. Decuypere and Hartong (2023) conceptualise the adoption of 'nudging' techniques of governance within the field of education as *Edunudge*. Such techniques are embedded in the psychological rationality and 'operate through the design or adaption of "choice architectures", targeting the psychology of humans in such a way that "desirable" behaviour is rendered more likely' (Decuypere & Hartong, 2023, p. 138). That is, when presented with a 'choice', users tend to adopt the default option even

when alternatives are available (Thaler & Sunstein, 2008). This thinking is readily seen in everyday techno-usage; the default 'Safari' browser is installed on all Apple products and has recently surpassed one billion users, in spite of Google Chrome's broader remit and popularity (Forristal, 2022). Panorama and Scout both sit in this default option space as the 'preferred providers'; it is there, and exists, so why would leaders choose to use otherwise? In this way, nudges are associated with very specific notions of '*spatiality* and *temporality*' (Decuypere & Hartong, 2023); that is, nudges are both positioned in and create specific spaces and times.

Covert digital nudging techniques are present in the visual depictions on the Scout Dashboard display page. The Dashboard display in Scout provides a 'visual overview of the current position regarding benchmarks and school target indicators for a selected school' (DoE, 2023d). A specific colour and icon code is used to represent the present status of each benchmark within this display (see *Figure 6.10*). It is important too to consider the cognitive associations with this particular kind of representation. A common connection that comes to mind is that of traffic lights; while there are obviously global differences in the structure of traffic lights, within Australia (the context of the research) the general vertical arrangement of red (stop), amber (slow) and green (go) is a familiar and consistent symbol. In the same way that traffic lights serve as a proxy for traffic enforcement personnel, this colour coding system facilitates conditions whereby school leaders are nudged to think about and act on key points of data in a very specific way. In the dashboard overview, items that are met with a green tick are points that can be celebrated, while those with an amber exclamation point or, worse, a red cross, are areas that must be dealt with immediately. Again, there is no mandate to act on these, but their entanglement with the School Excellence Framework and its inherent 'best practices' of strategic improvement list the Scout Dashboard specifically to complete their self-review situational analysis (DoE, 2024e).

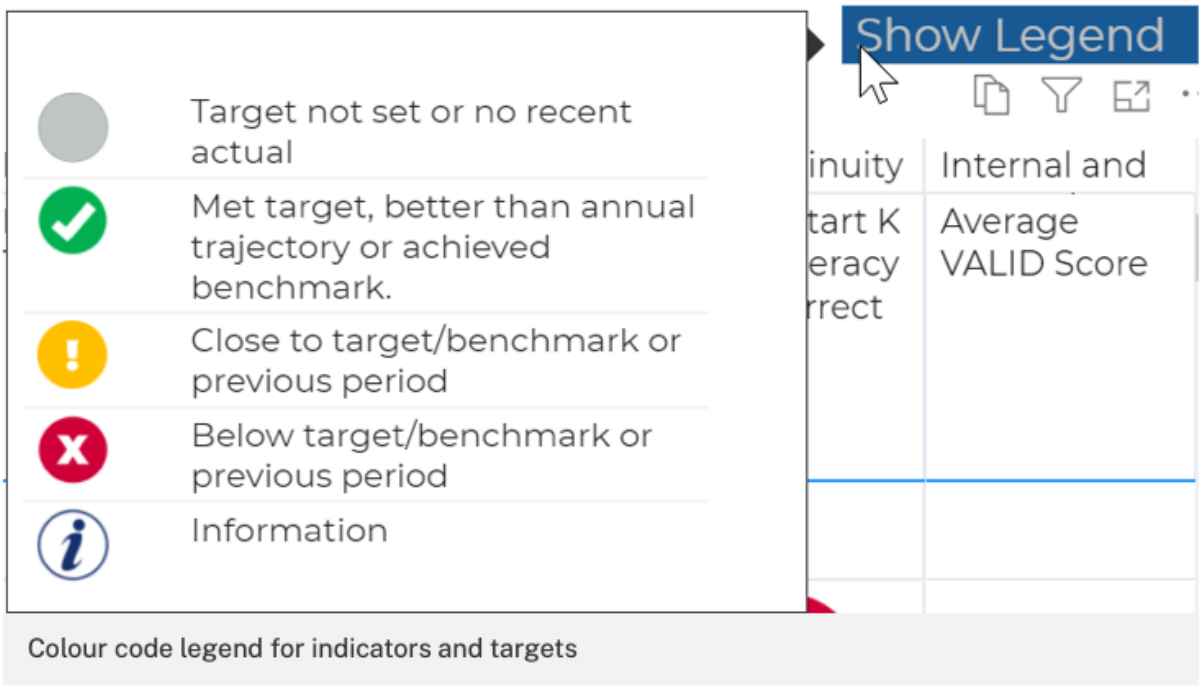


Figure 6.10: The key explaining the different visual representations in the Scout Dashboard (DoE, 2023e).

In the Victorian context, an analysis of a sample (n = 150) of school websites indicated that it was not at all common for schools to post their School Performance Reports on their website, with only three of these school websites doing so. There is *no* policy mandate to list these reports publicly on the school's website; however, these materials do become necessary as part of the four-yearly school review process. Schools *are* mandated, however, to upload their Annual Reports, which do, as mentioned in the previous section, contain a summarised version of the Supplementary School Level Report. In comparison to the Supplementary School Level Report, which is approximately *forty-seven* pages long for each school, the Performance Summary Component within the school's Annual Report is only *seven* pages long. Again, here we see a type of laundering process in action between the two static reports that serves to further condense the complexities of a school into a summative document for the broader school community. This 'cleaned' Annual Report only contains the elements of school performance that relate to the overall strategic Education State objectives. The explanatory opening of this condensed document states the purpose of this information is to engage parents and broader community members:

> All schools work in partnership with their school community to improve outcomes for children and young people. Sharing this information with parents and the wider school community helps to *support community engagement in student learning*, a key priority of the

> Framework for Improving Student Outcomes 2.0 (FISO 2.0). (VIC Annual Report – school name withheld to maintain anonymity; emphasis added)

Such messaging expresses the explicit role of the report to ensure the community understands their school in a very specific and datafied manner. School performance in a given domain (e.g., learning, management of bullying, attendance) becomes either greater than or less than their aggregated four-yearly average, or the school becomes a higher/lower performer in comparison to similar school- and state-level aggregations. This not only sets conditions for how staff within schools view their own performance, but it equally shapes how parents and the broader community view their own school as well, which can have serious implications for current and future enrolments. These 'snapshots' thus capture a moment in time that is 'scrubbed' of much needed temporal context.

Such representations offer a 'snapshot' perspective on what principals and schools are doing well and what needs to be addressed. While there is no mandate for engaging with them, their presence as a legitimate representation of performance encourages them to be addressed – by school leaders, by teachers and by the broader community. Gulson and colleagues (2022) describe this as a form of 'soft power' via practices of 'getting others to want what you want, [and] to value or desire what you desire' (Gulson et al., 2022, p. 8), but without it needing to be overtly stated. This also creates systemic impacts upon other roles within education, such as educational leaders responsible for overseeing multiple schools within a set network. In the New South Wales context, regional directors of educational leadership (DELs) are encouraged to 'use Scout for strategic planning *across your network*, such as setting school literacy and numeracy targets or monitoring school performance' (DoE, n.d.-b; emphasis added). The discourses used in a Scout training guide are indicative of a nudge approach:

> Scout provides several information reports which *can* provide Directors, Educational Leadership with the capacity to analyse data across multiple schools in their Principals Network. This *can help identify* collective needs across the network and enable a precise approach to providing support across different areas of school business. (DoE, 2023c, n.p.; emphasis added)

Here, DELs are being reminded that certain reports are available and might be of assistance to their role. Given that this is provided as a training resource, or an exemplar of sorts for practice, it creates conditions whereby DELs are encouraged – rather than mandated – to take up such an approach.

Not only does this language influence the kind of focus DELs implement when engaging with schools in their directorate, it also changes the organisational structure involved within the

platformed infrastructure. This is particularly relevant in the Victorian context, whereby Senior Education Improvement Leaders (SEILs) are charged with overseeing a large number of schools (approximately fifty). Given the scope of this immense workload, the platform becomes a mechanism by which they conduct their work. SEILs are working in conditions where they need to triage the schools in their network via these laundered representations and focus their attention on schools that are underperforming in line with the DSPM measures. Their access in Panorama also allows them to generate a network-level report of school performance, in which they too are 'nudged' to address specific areas of focus based on the overall cohort of schools in their network. These nudges direct focus towards the temporal horizon; towards visions of future 'improved' visions of school performance. However, in directing the gaze forwards, nudges also limit the array of possibilities one is encouraged to engage in (Kalpokas, 2019). That is, they close off certain lines of thought that are not easily represented through metrics and instead encourage the uptake of areas of focus that are within the range of the gaze.

6.7 Discussion: Productions along the transversal axis

This chapter has examined the temporalities that are produced in and by the platformed infrastructures surrounding Panorama and Scout. I have taken some creative liberty here with my deployment of the transversal axis of CCS; rather than focusing on the change in things over time within this chapter, I have instead made the concept of time the focus, specifically examining how time modalities are constructed in the platform (i.e., past, present, future) and the influence this has on the conditions in which leaders conduct their work. The analysis undertaken in this chapter still fundamentally aligns with Bartlett and Vavrus's (2017) conceptualisation of the transversal axis, in that it connects the horizontal elements to one another in addition to the vertical scales. As is the nature of CCS, there is an ability to attend to multiple axes in singular points of analysis. For example, while Chapter 5 explicitly focuses on the vertical axis to conduct a scalar comparison, there is undoubtedly overlap with the transversal axis through my attendance to the development of school performance policy *over time* through archival document analysis in order to attend to the 'historical roots' (Bartlett & Vavrus, 2017, p. 93) that influence the current policy conditions.

Both Panorama and Scout (and their associated infrastructures) produce their own versions of time which has implications for the conditions in which leaders conduct their work. Of particular importance is the concept of the 'present' that is developed by the platforms, which, as shown in this chapter, is often contentious as a singular representation. What constitutes a school's current datafied performance (or 'present') can be based on data collected both daily (i.e.,

attendance) and annually (i.e., NAPLAN), meaning that the present can be thought of as both yesterday and also a year ago. Given that performance is unlikely to remain static for lengthy periods of time, given that schools are places of constant learning and development, this renders school performance as something that can only be measured according to selective data points. This is reminiscent of scholars who have previously discussed that what counts in schools is that which can be counted (Mockler & Stacey, 2021).

School leaders are held accountable for their 'present' school performances through specific policy regimes associated with continual school improvement. Government schools in Victoria and New South Wales are subject to four-yearly school reviews, processes which are used to ascertain the most appropriate directions for subsequent strategic planning. 'Thinking with' temporal horizons (Luhmann, 1976) provides a way of considering the role of the platform's chrono-logics in this process; policy encourages the use of datafied representations produced by the platforms as a way to consider what the future might bring for the school. That is, the platforms provide representations of a school's current performance (i.e., the present) and their previous performance (i.e., the past), which leaders are then encouraged to use to consider their next strategic directions for their school setting (i.e., the future). Such practices are both complex *and* ordinary (Lunde & Piattoeva, 2025) in that they require timely alignment, but are also practices that are deeply embedded in regular school improvement agendas. There is a frequent looking backwards and forwards (via the platform's representations) as a key focus of leadership work in which the future is always visible on the horizon; there are always improvements to be made.

However, there is also a need to consider these past, present and future school performances as products of particular space-time contexts in which certain data representations have been both made possible and privileged in school performance regimes. I argue in this chapter that there is a need to consider the practices of data hygiene (Mulvin, 2021) that are present within the platformed infrastructures that work to translate the complexities of school into measurable units of performance. In this way, the platforms act as data launderers that portray simplified (and clean) interpretations of school performance that leaders are required to enact on. In the Victorian context this is done, for example, through algorithmic structures like the DSPM, which assigns schools to categories based on their current performance in conjunction with the change in performance over time. Leaders are presented with these categories as a way to consider their schools' performance within the context of their school improvement journeys. A key point of data hygiene practices is that they develop specific standards of 'cleanliness'; that is, they produce the standards of performance for which school leaders are held to account. For example, the Scout dashboards in the New South Wales context provide leaders with visual indicators

comparing their performance to pre-defined standards based on their prior performance. These codes (i.e., green tick, yellow exclamation mark, red cross) are specifically assigned based on expected performance trajectories (as established by past performance). As previously explored by Clutterbuck and colleagues (2023), this has consequences for how leaders view their schools (and the students therein) and can erase information that is critical to understanding the broader context of student learning.

As such, this chapter (along with Chapter 5) has demonstrated the need for showing appreciation to the social conditions that have shaped problems existing in the present (Bartlett & Vavrus, 2017). The representations of past, present and future as seemed by the platformed infrastructures inform a critical part of the work undertaken by school leaders in the form of strategic planning. However, such practices associated with school performance have become so normalised in the context of datafied school, and I argue that there is a need to consider the broader purpose of these logics. Ball (1995) describes the paradoxical nature of this, in that 'our rational, humane utopias are always formed within the discourses, dispositifs and epistemes from which we seek to escape. It is the past that is the problem here not the future' (p. 267). It becomes difficult to imagine otherwise or not participate in the broader platformed infrastructures because they are normalised and therefore disappear into the background away from scrutiny.

6.8 Conclusion

This chapter builds on Lingard's (2021) assertion that there is indeed scope to extend on temporal considerations of policy beyond mere historical configurations and considerations. While 'education policy has always had an intimate relationship with the future, promising preparation for a complicated tomorrow' (Webb et al., 2020, p. 293), the platformed infrastructures seek to examine the complex nature of this relationship as it pertains to past and present time. Once again, the task of examining the platformed infrastructures centres on starting 'in the middle' without trying to delineate a specific foundational point. Hoy (2009) comments on this challenge, stating:

> There is no need to discuss questions such as which came first, the chicken or the egg. The reason for this is neither simply because the right answer is the egg, nor because the question confuses logical and temporal priority. Instead, there is no issue of priority because there could not be one without the other. Transcendental arguments thus become unnecessary, given this deconstruction of metaphysical distinctions. (Hoy, 2009, p. 163)

This points to the specific notion of considering the dual temporal functions in that platformed infrastructures are produced within specific temporalities yet also produce their own temporalities. In the context of the platform, the estimations of school performance made and displayed in the

platforms are simply that, estimations, not precise measurements. They mirror our current ways of *understanding* educational performance, not necessarily the educational performance itself. Horizon-oriented thinking directed towards continual school improvement agendas form a key component of keeping the platformed infrastructures in flux, whereby 'reform efforts are the habitual attempts to improve upon its failed memories of a glorious future' (Webb et al., 2020, p. 293).

What can be seen within the platformed infrastructures surrounding Panorama and Scout are a distinct enmeshing of temporal lines; a precarious enfolding of the past to describe the present and subsequently make predictions about the future. Such anticipatory governance is a key and standard feature of organisations. However, anticipatory governance is less concerned with the accuracy of the predictions, but rather serves as a mechanism to continue looking towards the horizon as a necessary component of school improvement. As a technique of leadership, it is essential to keep the focus ahead on what to do next; always in a state of becoming rather than being. Improvement agendas are arguably what keep schools in this present moment. Anticipatory governance or horizon thinking becomes a necessary mechanism; it continually demonstrates that there is always work to be done. But it is vital to acknowledge that there is also a spatio-temporality around that work; a recognition that data have been represented or made to be made to be understood in a particular way and to constitute particular problems. Such processes ultimately 'launder' the data representations in such a way that they can be acted upon.

However, it is equally important to remember that such imagined futures are entirely created in the conditions of the present moment. In the present moment, this includes not only the datafication of education, but also additional laundering of those datafied measures to further 'clean' up the representations for them to be accessible to different audiences, including school leaders, teachers and broader community members. Platforms serve as the ultimate digital launderers, translating the messiness and complexities of schools into a clean and simple by-product. The enmeshment of typical chrono-logics surrounding past, present and future, emphasise the important role the past plays in present and future contexts. Here, 'the past is not some static being, and it is not a previous present, nor a present that has passed away; the past has its own dynamic being which is constantly renewed and renewing' (Colebrook, 2002b, p. 77), and this is a key point in the construction of the laundered depictions within Panorama and Scout.

In the next chapter, I attend to the relational productions between the embodied leader and the platform in light of the temporal productions (discussed in this chapter) and the foundational productions (discussed in Chapter 5). I 'think with' (Jackson & Mazzei, 2012) the concept of metric fixation (Muller, 2018) along the horizontal axis of the CCS design to specifically look at

the interactions between interviewed principals and the respective platforms in their state context (Panorama in Victoria, Scout in New South Wales).

Chapter 7: Relational

Figure 7.1: *Can't Help Myself* (2016), installation by Sun Yuan and Peng Yu.

From *Guggenheim New York*, retrieved from https://www.guggenheim.org/artwork/34812. 2025 The Solomon R. Guggenheim Foundation.

Can't Help Myself *is an original installation artwork by Yuan and Yu commissioned for the Guggenheim. Confronting in its imagery, this piece consists of a robotic 'arm' of sorts surrounded by a viscous, red liquid. The arm has been programmed to sweep the liquid back into place when specific sensors indicate the liquid has seeped beyond predetermined boundaries.*

7.1 Introduction

Given the foundational and temporal productions of the platformed infrastructures of Panorama and Scout discussed in the preceding chapters, this chapter now discusses their impact on the embodied school leader and how they understand and enact their work. In this way, I focus on the *relational* construct between the school leader and the platform (and its broader infrastructure) to consider the ways in which they influence one another. In this chapter, I draw specifically on Site 4 of the data corpus, involving interviews with Principals (n = 7) on their use of the digital data platforms respective to their state location, and focus specifically on the third research question, *how are digital data techniques and technologies (re)shaping how leaders know and lead their schools?* Like the previous findings' chapters, I will be once again 'thinking with theory' (Jackson

& Mazzei, 2012) and will specifically use the concept of *metric fixation*, as expressed by Muller (2018).

While the focus of this chapter is on the horizontal axis of CCS that features the cases of Panorama and Scout, I home in on what could be considered *sub-cases* in the form of the individual experiences of the principals. This type of case renegotiation is a feature of the CCS as different logics can be required for different parts of a given study (Bartlett & Vavrus, 2017). The platformed infrastructures of Panorama and Scout are still contextually vital to understanding the 'nested' sub-cases along the horizontal axis as each participant is responding based on a specific configuration of leadership conditions (see *Figure 7.2*). However, I am cognisant of the discrepancy between the number of interviewed Principals using Panorama (n = 5) and the number of interviewed principals using Scout (n = 2), and that this research *does not* seek to provide a generalised account of one group of principals' experiences with their respective platform over another. Instead, I present these 'sub-cases' to consider individual principal's relational experience with the platform and its infrastructure and then unpack how these inform their leadership practices. Care has been taken to ensure the anonymity of principals; they have all been assigned a pseudonym based on their order of being interviewed and only minimal contextual details have been provided (see *Table 7.1*).

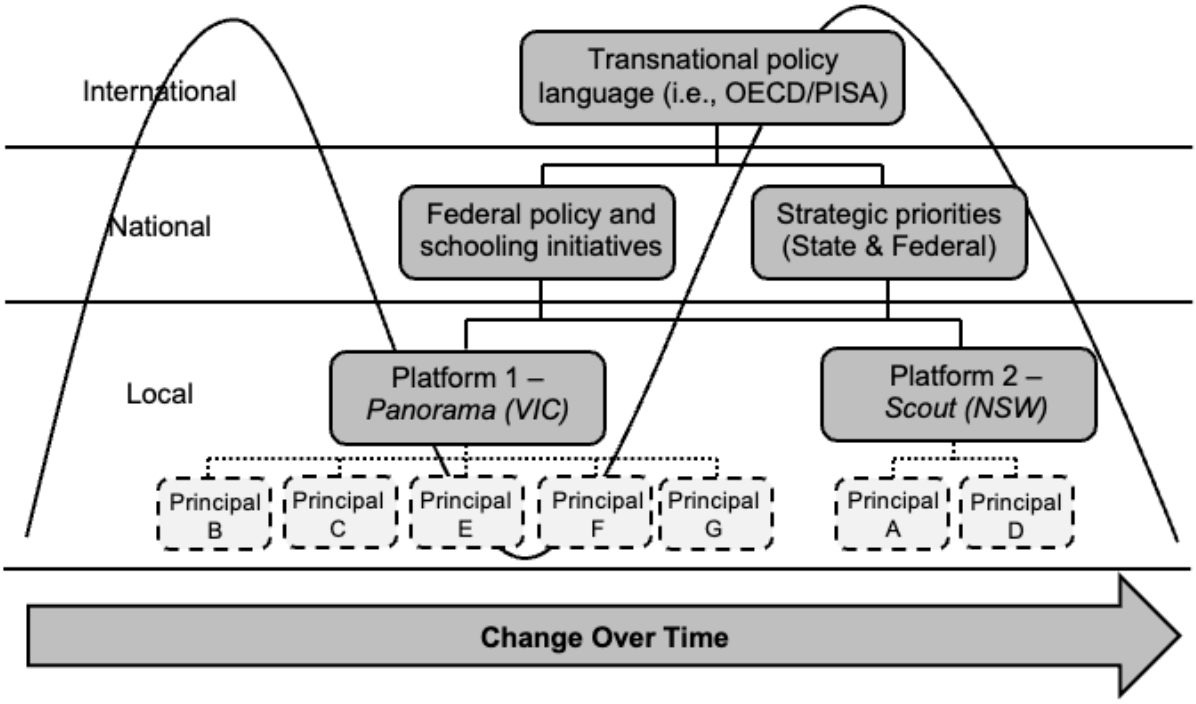


Figure 7.2 A consideration of the principals as sub-cases in the overall CCS design for the analyses in this specific chapter.

Pseudonym	State	School Type[49]
Principal A	New South Wales	Secondary
Principal B	Victoria	Secondary
Principal C	Victoria	Combined
Principal D	New South Wales	Primary
Principal E	Victoria	Combined
Principal F	Victoria	Primary
Principal G	Victoria	Primary

Table 7.1: The assigned pseudonyms for each interview participant and basic details about their principal context.

As previously stated, the aim of this thesis is not to portray the use of data in leadership in a negative light. Rather, I consider how such data practices have come to be in the presence of platformed infrastructures, and how they are made to matter in the context of school performance and improvement. As I have formerly mentioned, measurement and data are not bad things in themselves, but we do need to understand and challenge what it can (and does) become as part of broader platformed infrastructures. Muller (2018) describes how it is in the *application* of data where it can '*distort*, *divert*, *displace*, *distract*, and *discourage'* (p. 4; emphasis added). In the sections that follow, I take these five alliterated verbs to discuss the relational encounters produced within the platformed infrastructures from the perspectives of the embodied leaders.

I found the artistry in the above static image of the installation *Can't Help Myself* especially pertinent when considering this chapter. On a surface level, the title of this installation might imply a lack of agency and autonomy on the robot's behalf. Upon deeper reflection, however, I think that it says less about autonomy and more about the very programming of the robotic device itself; the robot physically cannot help but to continually redirect the liquid back into the predetermined boundaries because that is how it has been programmed to function. While I am not metaphorically suggesting a scenario where we consider school leaders *as* robots, I believe that it offers an apt representation to consider how the machinic discourses (i.e., the meaning-making processes produced by digital technologies) of datafication and the logics of platformed infrastructures have become so engrained in leadership that it fundamentally reconfigures how leaders conduct their work.

[49] School Type refers to the school's student enrolments, categorised as Primary (Year Prep/equivalent – Year 6), Secondary (Year 7 – Year 12) or Combined (Year Prep/equivalent – Year 12, often called P-12 settings).

7.2 Distortions in the platformed infrastructures

As Muller (2018) explains, there is an assumption that since we as a society are now aware of the fallacies of metric fixation, that we can consequently anticipate the common pitfalls of datafied regimes. However, the identification of such pitfalls is not always so straightforward, since there is a subjectivity that is implied within such processes; that is, what I perceive to be a pitfall may not align with the perceptions of someone from a different industry, for example. As discussed in the previous two analysis chapters, representations of data are inherently products of socio-political choices – the various choices made by a specific individual or group of actors in terms of what is to be measured, by whom and for what purpose, rather than being inherently objective and trustworthy. As such, I have used Muller's conceptualisation of metric fixation to consider the various junctures that are produced through a principal's encounters with platforms. As explained in Chapter 3 (section 3.4.3), metric fixation is a term used to explain how quantifiable measures come to be used in ways that produce unintended consequence.

There were moments when the interviewed principals believed the data representations on their respective platforms produced *distortions*, or misrepresentations, because of, for instance, technical aspects around how (and when) the data are collected, as well as the size of data sets relative to representation. Principal A (NSW) described Scout as having 'huge inaccuracies and lags in information' that, at times, counteracted the timeliness proposed by the inclusion of the platform in everyday leadership work:

> …The lag in the system, it just makes it *completely unfit for purpose*. Because I can never go to it, knowing how accurate the information is, and the amount of *time it takes* me to extract that sort of data – versus keeping people actually across their mandatory training – is *not worth it*. Because every time I pick a date and do three-hours work, *I know it's going to be wrong*. I don't know how wrong, that's the unknown, but I know it's *not going to be remotely accurate*. So that's *a pain in the ass* and also, attendance data. You know, we're judged very deeply on our attendance data, but it's *very laggy*. (Principal A, NSW; emphasis added)

Here, Principal A (NSW) is describing how the Scout platform creates further work for them to attend to and encourages them to work in ways that they know are problematic. The two examples they discuss are around forms of compliance: ensuring that staff have completed mandatory training modules, and that the student attendance data are kept up to date. Principal A is describing a situation where they are using the data provided in Scout to ensure their staff are compliant by completing their mandatory training modules (which include Department-mandated topics like mandatory reporting and occupational health and safety) as part of their principal responsibilities.

The issue that this principal is describing is that they spend time going through the data reports on Scout to see which staff still need to complete outstanding modules, only to find that those staff have already completed the modules upon speaking with them directly, and that the system simply has not updated yet.

Principal A notes a similar lag with the attendance data. There is a sense in their response that such aspects of their work are high stakes, upon which they will be 'judged very deeply' (Principal A, NSW), and yet those representations are not always correct at the time of display. This means time spent following up issues that are not exactly leadership issues but are rather issues created by the delays in the platformed infrastructures and their syncing of information. Similar to findings from other scholars (for example, Pangrazio et al., 2023), the timesaving promises of technology are not always actualised, with users expressing frustration about time*wasting*, rather than time*saving*. Such thinking is an example of the productive capacity of the platformed infrastructures in that they are always producing and making the infrastructure expand. The 'lag' created by data being pulled from various places means that this principal is encountering the Scout platformed infrastructure in a way that is problematic, and there is a disjuncture between what it is capable of doing and what the embodied leader thinks it should be able to do.

A common theme that emerged throughout the interviews, particularly for those principals working in smaller school settings, was that of distorted data sets and the impact that this had on how their school performance was being measured. In the Victorian context, the Differentiated Schools Performance Method (or DSPM, described more substantially in Chapter 5) used to assign schools to one of four specific performance categories cannot be implemented for schools with low enrolment numbers. As mentioned in Chapter 5 (section 5.5), this renders these schools as statistically invalid, although policy is clear to state that it should not change the way in which these schools are handled by the Department in review processes. However, the measures can also be problematic for schools with enrolment numbers that fall *just above* this threshold as well. For instance, Principal G (VIC) explained how 'as a small school, one child can push us up 5% or push us down 5%' in relation to measuring the school's performance using the DSPM. Here, the principal is referring specifically to the change level aspect of the DSPM, which compares a school's most recent results across the key categories to results from the previous three years. This comparison is then assigned a rating (see *Figure 7.3*) which is then plotted onto a table to determine the overall rating for each measure (see *Figure 7.4*), with each colour in the table correlating with a specific category (see *Figure 7.5*). Principal G continued, stating:

> So, for us, *one child* will put us into increase or decrease, *two* would put us into significant either way. And therefore, that changes our performance grouping. (Principal G, VIC; emphasis added)

Here, we can see the significant impact of smaller enrolment numbers on the change figure, and how it can distort the overall measurements used to determine a school's performance.

Current Level	Change Level
5 – Very high	5 – Increased significantly
4 – High	4 – Increased
3 – Medium	3 – Maintained
2 – Low	2 – Decreased
1 – Very low	1 – Decreased significantly

Figure 7.3: DSPM ratings in Victoria (DET, 2019, p. 4).

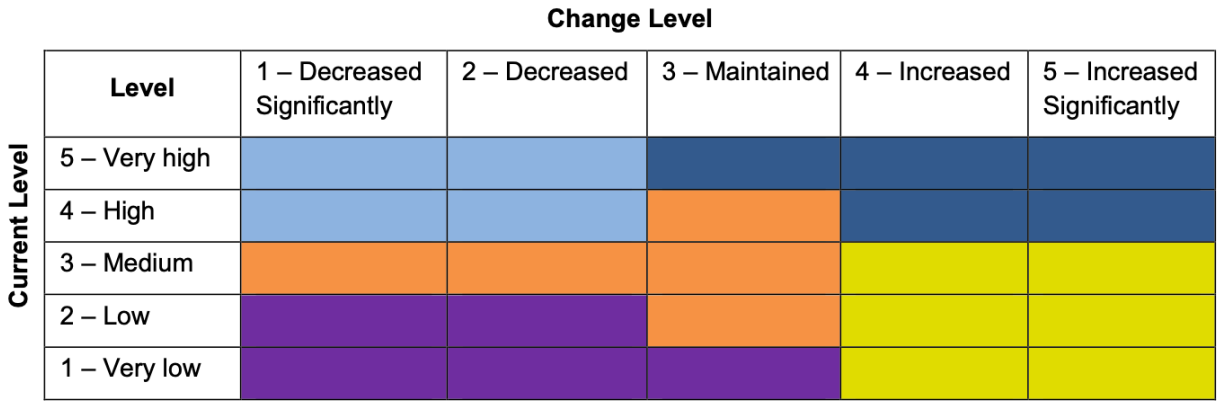


Figure 7.4: School Performance Table in Victoria (DET, 2019, p. 4).

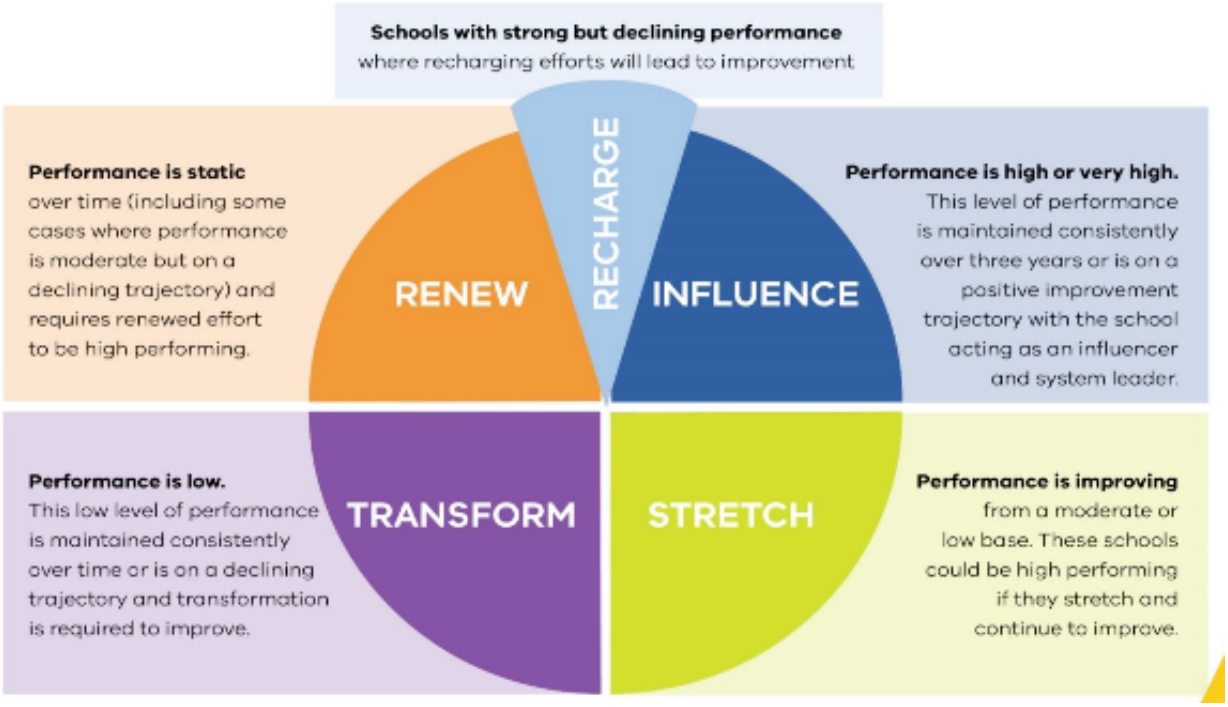


Figure 7.5: The five school performance groups in Victoria (DET, 2021b, n.p.).

There was a sense of frustration with the representations within the data platforms and their lack of malleability. In the following example, we can see how the principal is explaining the impact of their attendance representations; it is not that they have a school-wide attendance problem *per se*, but rather that there is a cohort of students significantly skewing the data. Again though, the view is on the school as a whole here, with the principal being accountable for the whole representation:

> …in a big school like us, we've got 1000 kids. I'd have probably 15 to 20 kids whose attendance is below 10%. You take that 15 to 20 [kids] out of my data, [it] makes a huge difference. Like over the year, they will have 300 days absent. (Principal B, VIC)

Here, Principal B is referencing the way that the Panorama platform is *producing* an attendance problem, rather than this attendance representing an actual problem in their professional opinion. Such thinking also speaks to the perverse nature of data measures in that they render the students that sit as outliers in the metrics as problematic. In this case, Principal B is frustrated that they are not able to physically remove this group of students from the data, which they believe would deliver a fairer representation of how their school is actually performing in terms of student attendance. Here, the problem is perceived to be one of representation, rather than describing an actual problem from the perspective of the principal.

This sentiment was similarly expressed by Principal F, also in the Victorian setting and also leading a small school. They noted how 'one kid can drop us a massive percentage' (Principal F, VIC) due to their school having fewer enrolled students. This principal clearly acknowledged that while they understood the 'why' behind the low attendance rates, the impact that this had on their overall performance data was still significant:

> These kids have got *significant medical needs*, but I go, that's four kids that are *killing my data*. And you know, two of them are grade six this year, so take them out of the equation and next year *my attendance data will look better*, because I don't have that school refuser. I don't have the high medical needs [student]. (Principal F, VIC; emphasis added)

Even though Principal F is dealing with exceptional circumstances that they view to be out of their control (school refusal, medical needs), their portrayal through the data reflects underperformance on the school's behalf. The emotive language Principal F uses to describe how these kids are 'killing' their data indicates the level of pressure this principal is feeling as a result of these data distortions. Additionally, 'killing the data' is not the same as killing student engagement or learning, which speaks to the representations of performance and their disjuncture from the lived experiences.

However, while the principals found the data representations problematic in many ways, there was still an overt sense of their being 'expected to use it' (Principal C, VIC). This caused some conflict among the responses, in that although the problematic aspects were pointed out, there was also an overarching acceptance of the platform as a necessary component of their role:

> Scout. Yeah, it's just, it's a *good idea*. It is a *really good idea*. But the problem, the fact that it's *not accurate*, just drives me insane. (Principal A, NSW; emphasis added)

Although Principal A is frustrated with the inaccuracies of the data representations as evident in their previous responses, they still acknowledge that the platform *seems* like a good idea, even when it is inaccurate. Thus, the *logic* of collecting and collating such data is 'really good', even if the execution of this logic *as platform* (in programming, in practice) leaves much room for improvement. There is also, implicitly, a fundamental level to which principals accept the data measures, despite these obvious distortions. Principal E (VIC) further demonstrates this, stating that:

> I don't think that you're ever going to have perfect measures. And I don't hold things in that way. (Principal E, VIC)

‘Thinking with’ metric fixation, we can see this to be an example of the persistence of datafied beliefs, in spite of what could be considered as pitfalls to such regimes. Despite principals specifically pointing out that the representations within the platforms are problematic, and are very often ‘unfit for purpose’, there is still a common underlying belief across the sub-cases that they serve a useful purpose within their leadership roles. This is also an example of the groundless ground of datafication as addressed in Chapter 5; on the one hand, there is an acknowledgement of the problematics associated with data metrics, including their ability to distort the datafied representations of their schools, yet their use still endures in spite of this acknowledgement. In large part, this is due to other parts of the platformed infrastructures, specifically the policy documents therein, and how they divert attention towards the data, even when disjunctures are present.

7.3 Diverting attention towards the data

In many ways, a large part of why platformed infrastructures endure in spite of their perceived failures is due to the manner in which (user) attention is *diverted* back to the data platforms and the associated measures of performance. Even when the gaze redirects away from the data and the accompanying platform, there are still mechanisms that draw attention back to it. Principal E in the Victorian setting spoke about how they used the data and platform’s representations to divert their staff’s attention towards the data. They said:

> I guess it's *building the why*, you know, and helping staff to understand…what is the *actual standing* of not only our school within our school…but also, compared to the comparative sort of data as well, is probably important to see. Well, okay, is what we're doing having the impact you were hoping it's gonna be having? Yeah, and also just around, you know, understanding *what they [the staff] are struggling* with. What *aspects of the practic*e *they're not happy with*? Anecdotally, if they're not happy with, you know, the impact that it's having just from that teaching sort of perspective, then we've got to actually say, okay, well, what's our data telling us we're actually doing well? (Principal E, VIC; emphasis added)

In this way, the datafied representations become a form of evidence that leaders can use to support any judgements that are made by staff members in the school. Principal E used the term ‘anecdotally’ to arguably describe the kind of judgements being made by staff members based more on their own professional observations or ‘sensing’ – that is, not from the data present(ed) on the platform. In turn, the redirection towards the data to substantiate judgements represents a privileging of ‘the actual standing’ over mere ‘anecdote’. In this way, any professional judgements by educators that is not based on standardisable data measures are considered less effective and

less acceptable (Selwyn, 2022) reaffirming the platformed data as the most accurate surveyors of school performance.

Such uses of the datafied representations are also encouraged by the more senior leaders within the overall policy landscape. In the Victorian context, for example, Principal C spoke about how the platforms and the representations therein are 'definitely referred to' at their principal network meetings with their area's executive leaders (SEILs), particularly if a new aspect of that data had been released. Principal C spoke about recent emphasis on the *Staying in Education (SIE) dashboard*, which 'identifies your high-risk students' (Principal C, VIC). According to Department information within the online Policy and Advisory Library (PAL), the SIE dashboard has been 'developed to identify students in Years 4 to 12 who are at risk of disengaging from school and leaving school early' (DET, 2024i, n.p.), with the intention of providing schools with earlier opportunities for proactive intervention. On this policy site, schools are encouraged to access the SIE dashboard via Panorama. In a fact sheet on the topic of identifying students at risk of disengaging (also accessible on this policy guidance page), it is stated that schools can draw on various 'data and tools' to identify those students who are at risk of disengagement from school. This non-extensive suggested list of data and tools includes consulting enrolment information (particularly information around family background, educational history and 'personal issues'), attendance data and educational and welfare assessments conducted by support services. Presumedly, then, this is the sort of data utilised within the SIE dashboard to provide its algorithmic projections of student 'riskiness'.

As with many of the other dashboards and representations, Principal C addressed their lack of understanding around the methodology behind the SIE dashboard. However, during the interview, Principal C expressed their confidence in the dashboard in spite of this lack of specific information:

> *Me:* And how does it [the SIE dashboard] identify them [the students at risk of disengaging]?
> *Principal C:* It colour codes them. It must have an algorithm or something that it generates based on attendance, and NAPLAN data and teacher judgement data, right? And then it takes all of those things and then sort of almost works out a judgement for how likely they are to be at risk of disengaging.
> *Me:* Do you find it accurate?
> *Principal C:* Yeah. And it must, it would also take into account EAL, Indigenous, equity funded, all that kind of stuff. So, it's quite a good representation. Yes. It's very accurate.

So, even though there was a significant lack of understanding about the specific measures used and how they are arranged algorithmically to determine the likelihood of student retention, the

principal above still felt able to affirm it is 'very accurate', suggesting there is a necessary 'blind trust' that these platformed representations and predictions *must be* accurate. This very much connects back to the analysis concerning the 'groundless ground' within Chapter 5, where there is an inability to question the legitimacy of datafied regimes as they are buttressed by their own logics. In this case, if Principal C has been previously accepting of other parts of the platforms and their representations, then their acceptance of newer functions, like the SIE dashboard, might also occur in spite of limited information around how such representations are derived.

Another policy process that diverts attention towards the data platforms in each respective state is that of school improvement. As discussed in Chapter 5 (section 5.6), there is an explicit connection between school performance and improvement journeys and the data platforms. In Victorian policy, for example, advice around the development of targets within a School Strategic Plan (SSP) expressly states that 'targets are expressed as a proportion of students…and should include a baseline figure and numerical target' (DET, 2023d, p. 3). The task for principals then becomes matching any defined goals they generate with quantifiable targets that from within the suite of data sets collected throughout the school year; that is, goals must be representable as and through improvements to *numerical data*. When asked about the process of formulating targets in a new strategic plan as part of the school review process, Principal C (VIC) responded:

> It's heavily encouraged in the process. I'm pretty sure the SEIL [regional leader] heavily encourages that if you've got something in an area of student engagement that you go, well, let's look at the attitudes to school survey, *because we can track that*. Get one [data set] that matches [the goal]. (Principal C, VIC; emphasis added)

Such 'encouragement' as explained by Principal C is another example of how the datafied measures have become an accepted and valorised part of understanding schools and their performance. Ultimately, this encourages principals to formulate judgements that incorporate methods of digital organisation (Lewis & Decuypere, 2023) and diverts their attention towards datafied representations of performance ('we can track that') that 'match' their school targets.

In this way, diverting attention *towards* the data becomes an integral part of school improvement agendas, even while participants acknowledge this process is far from perfect. As pointed out by Principal G, also in the Victorian context, there are many measures that largely sit outside of school control. They discuss a previously included measure from the School Staff Survey (SSS), akin to the statement 'our kids come to school ready to learn' (Principal G, VIC), which has been subsequently removed based on feedback because 'schools don't control how the kids come to school. That's just a societal, social, demographical situation. There's nothing we

could do about that' (Principal G, VIC). While this example is one that has been 'repaired' in the platformed infrastructure through the provision of feedback, it still has implications for how the principal proceeds with conducting subsequent performance assessments. Principal G goes on to explain how, through the alteration of measures, it further complicates the processes of strategic planning and monitoring:

> But the problem is that every time you respond to something like that, it throws all of your starting data out because *now you can't compare*. So, you've got this goal in your SSP, but that data has changed…*it's impossible to hit* [the target] now, no matter what you do. (Principal G, VIC; emphasis added)

Again, we see annoyance towards a highly problematic process: if the measures change but the original targets remain concrete, then meeting these targets is an *impossibility* for any principal. The platform thus creates a paradox – the measures need to be consistent and unchanging to be comparable, and yet responsive and dynamic to enable feedback and change. Much like the measure in question, this is fundamentally out of a principal's locus of control, and yet they still bear the weight associated with the failure to meet set targets, not the flaws in the platformed logics. This has the tendency to undermine the integrity of systems of education through the displacement of authentic goals with ones that are more easily measured but are less meaningful for supporting teaching and learning.

7.4 Displacement of professional judgement

In regimes where metric fixation is present, there is a tendency for the *displacement* of professional judgement to occur, at the same time, as favouring numerical indicators. This was indicative in the interviews, where principals specifically used the language of the platformed infrastructures to discuss their perceived schools' performances. In the Victorian context, Principal C described their trust in NAPLAN data representations as displayed on the Panorama dashboards:

> *I look a lot at NAPLAN data*. I look at teacher judgement data, but I don't rely on that as much because *I don't trust that as much.* (Principal C, VIC; emphasis added)

Here, the principal is specifically indicating their valorisation of NAPLAN data, a standardised testing mechanism, over teacher judgement data, which are largely derived from the professional knowledge and observations of teachers. This suggests more than only diverting attention towards numerical data; it is also, importantly, about displacing attention and value away from more anecdotal forms of data, like teacher judgement data. Similarly, Principal G used the language of

the DSPM, and specifically the categories that are assigned to various areas of school performance, to explain their perception of their school's performance:

> When I started in 2019, we were *Transform* the whole way through. We tweaked a few things, and then we were in *Influence* in a lot of those things. So, I think now we're overall *Stretch*, I think, which is probably a good indication, overall. (Principal G, VIC)

At the same time, a displacement of professional judgement by numbers was equally problematic for high-performing schools. Principal F used the language of the DSPM, specifically the categories that are assigned to the various areas of school performance, to explain an aspect of their school:

> We're sitting at *Influence* for attitude to schools. So, we're sitting at 98% for students, self, sense of connectedness to the school. And so, we've got ridiculous [-ly high] scores for all that. *How do we improve that?* (Principal F, VIC; emphasis added)

Here, Principal F discusses their school performance relative to the DSPM, outlining their categorisation of 'influence' as both success and as impending failure – a high baseline means less opportunity for growth. This points to an extremely important issue associated with the DSPM; while they currently achieve in the category of influence due to their high level of positive responses in both student and staff satisfaction surveys, the only options for their future recategorisation will be 'renew' (if these scores remain static) or 'recharge' (if they decline). A disproportionate focus on growth, ironically, seems to punish those schools with the highest performance. These are often referred to as 'ceiling effects' (Koedel & Betts, 2010) in the scholarship around accountability and highlight the systemic flaws in testing design models that constrain further performance once a particular threshold has been attained.

Principal B expressed similar frustrations with the school performance reporting mechanisms associated with Panorama. Yet, fundamentally, they also demonstrated a clear engagement with this way of thinking:

> …you can be performing really highly. But because you've gone from a high 95% and you dropped to 93[%], on attendance, suddenly you are now *Transform*. (Principal B, VIC)

Here, we can see how Panorama is actually shaping how Principal B talks about their school. The principal makes comments demonstrating their quantifiable thinking in going from a 'high 95' to '93', with this influencing how they see and talk about their school performance.

Among the respondents, there was a common thread of usage in that while principals were using the content within their data platforms, they were generally manipulating it to suit their own needs and contexts. Principal C (VIC) spoke about how they rarely used the pre-determined displays for their strategic planning work:

> I find at student level, like, you can download [it] into Excel to get student level [data], but then there's too many colours, and it just doesn't work in terms of putting something together as a snapshot. (Principal C, VIC)

Here, we can see that there is engagement with the data platform, but not in the way that was necessarily intended from a notionally 'top-down' conception. The principal is displaying trust in the raw data that is being gathered but not in the dashboard representations, preferring instead to engage with the data in their own way; that is, using their own professional judgement. Here, the dashboard representations were being perceived as helpful in enacting leadership, but only to a certain degree. Principal C went on to say:

> …so, I'll use the data…[to] dig down to cohort and student level. I'll have to recreate it because I find once you get to a certain level, it's not as helpful. (Principal C, VIC)

Once again, this principal is demonstrating the ineffectiveness of the platforms within the way that they like to conduct their leadership work. However, rather than abandoning the data usage because of its poor representations, Principal C has to do additional work to make the data work for them in their particular context.

There was also a strong sense that the platformed infrastructures were integral in shaping how schools are overseen by more senior members of leadership (e.g., SEILs in the Victorian context, DELs in the New South Wales context). There was overt knowledge that more senior leaders could access the same representations that the principal themselves could. As stated by Principal A (NSW), 'DELS have access to everything…everything I can see, they can see'. There was generally more of an unemotional acceptance of this, rather than seeing it as a method of surveillance to be feared by school leaders. This was reflected in an exchange with Principal B in the Victorian context:

> *Me:* What about when your SEIL comes in? Do you think that Panorama as a platform impacts how they're doing their leadership work?
> *Principal B:* I think it does because, well, they look at Panorama and then they come in and ask me the question, what's going on?

Here, Principal B demonstrates an awareness that their designated SEIL is building an understanding of the school *prior to* engaging with them as the principal, or before visiting the school in person. There is an acceptance that this is just standard practice; it suggests a normalisation of engaging with school data to have informed conversations with the principal about that school. This is reflective of research by Heffernan and Selwyn (2023) who described how digital practices influence both the temporal and spatial arrangements of how leaders engage in their work. In the case of Panorama and Scout, their implementation directs executive level leaders to the digital space rather than the school site.

There were some mixed messages about these surveillance aspects of the data platforms, but the principals did not appear to have this thinking at the forefronts of their minds. In fact, when prompted, Principal C refuted the primary use of the platforms as being mechanisms of surveillance, stating Panorama is:

> …not a monitoring tool as such…I see them [the dashboards] more as overall pictures…Whether that shows a lack of knowledge or understanding of what the system could actually do... (Principal C, VIC)

Here, the principal sees the primary use of the Panorama platform as being to provide 'overall pictures' of schools and their relative performances. They buttress this by affirming that this could be a misconception on their behalf, putting much trust and faith into the system in which they are employed. On the other hand, Principal A in the New South Wales context pointed out their perception of Scout was as a compliance checker for more senior leaders:

> …obviously there's *loads of ass covering*, so my director can say, 'Of my 20 schools, everybody's met the benchmark of numeracy and literacy'. (Principal A, NSW; emphasis added)

Reflecting on the constraints associated with being a senior leader of multiple schools, Principal A implies that Scout provides a mechanism for school oversight at a distance, without the need to be physically present at any of the schools.

Such considerations are understandable given the enormity of the task for those in senior leadership roles who work *with* schools, rather than *within* schools (DELs in NSW; SEILs in VIC). In the New South Wales context, as indicated by Principal A, a DEL can bear the responsibility for ensuring that twenty schools in their remit are all performing at appropriate levels. In the Victorian context, the number of schools that a SEIL has in their remit can be even higher than this. In Victoria, Principal G reflects on the difficulty they perceive for SEILs:

> I think it's very difficult for a SEIL to know a school intimately to the point where, you know – so, it is easy to match the data. If it's working, and I'm not complaining, and the kids are progressing, then let's leave it at that, because for me as a principal, that's also challenging. (Principal G, VIC)

If a principal is feeling challenged by the task of knowing their school intimately, then it makes sense that more senior leaders who are tasked with knowing multiple schools are going to find this an even more challenging task to complete. Principal G continued:

> And I know that one of the drivers of our work here is that I'm in classroom every single day. If I wasn't, then how can I comment on what we're doing? So, it's the same for a SEIL, they're not in classrooms, they're not there. I think our SEIL…I don't think he's need[ed] to visit this year at all. I think we're doing okay. So maybe, like, as part of energy goes to other places. (Principal G, VIC)

There is a sense here of triaging (Gulson et al., 2022) that occurs in relation to the representations on the platforms – schools determined by their data to be 'doing okay' need less physical oversight and governance that other schools. Given the challenges that more senior leaders face in terms of the enormity of their role, it is perhaps unsurprising that they rely on representations within the platform dashboards to indicate where they need to attend their efforts. Principal B (VIC) reflects on the subtly of these practices as something implicit, not overt, in some of the points of contact that the principals receive:

> Like, they don't come in come in and sort of rant and rave or anything like that. It's not, it's not like that. But I will get an email from someone in the Department quite regularly about attendance. (Principal B, VIC)

Here, the principal is describing what they see to be a subtle reminder of the Department's presence within the platformed infrastructures. A simple email alerting the principal to an issue with student attendance from a Department employee is a stark reminder that other people have access to the information about their schools, and they will use this to identify when the leader needs to attend to the problem.

However, this can also be a problematic process for principals. While they are being alerted to an issue (based on the datafied representations), there is not necessarily support provided to drive up those numbers in a meaningful way. In Victoria, Principal G also identified the importance of attendance data being flagged:

> So, what happens is, because the department are holding themselves and each other accountable, they're pushing a lot back on schools and saying, 'Explain that this child had not returned to school this year', or 'This child has had missed this [x] number of days'. And we get this request for more information about every fortnight… when we seek support from the attendance or engagement officer within the Department, they say, 'Well, it sounds like you're doing your best'. Well, *stop beating us then about this data when you're not, you can't offer me more advice*. (Principal G, VIC; emphasis added)

So, while there is a push for explanations of the data, particularly around the poor attendance rates of students, there is often a lack of Departmental support about how to improve the actual problem at hand. The focus is on the numbers and attempting to improve them ('beating us about this data'); however, there is a real lack of strategic thinking to further support schools with these issues ('you can't offer me more advice'). Again, this is unsurprising; schools are highly complex places and student attendance is something which can be largely outside of a school's control, let alone a distant Department leader who may not have intimate knowledge of the school and its community, outside of the platformed data.

7.5 Distractions generated by the platformed infrastructures

As we see above, questioning reminders about underperformance but without the tools to improve that performance is a challenging issue for principals, and arguably one that distracts them from work that they do see as valuable in their settings. Such *distractions* were also expressed throughout the interviews because of the platformed infrastructures. There was a sense that the platforms and their broader infrastructures were distracting the leaders from other important, non-datafied tasks that they perceived to be central to their roles. In the New South Wales context, Principal A spoke about their frustrations with the various platforms with which they are required to engage, in terms of how much additional labour is required to get these systems to work:

> *What pisses us off the most is that we have all these platforms – SPaRO, Scout – and they don't talk to each other*. So, the department knows every cent that I've spent, because there's twenty ways to show it. But when I go into SPaRO, I have to re-enter it all. It tells me how much I had to start with, because it tells me what my budget is. But I then have to go into SPaRO and put in how much I've spent against any initiative on the school plan, even though I've already put in that information when I've acquitted purchasing cards and so on. (Principal A, NSW; emphasis added)

Here the principal is sharing their exasperation in how the platformed infrastructures are not always working in ways that they perceive to be effective and timesaving for them in their

leadership roles. Principal A makes it very clear that there are many representations of their school budget that are available, but that they are also required to manually input that information into accompanying platforms, like SPaRO, rather than the information being automatically drawn across the different platforms. Such a lack of interoperability ultimately hampers effective data use (Williamson, 2017), and this runs counter to the logics of efficiency and accuracy often central to platformed governance.

There are also significant inconsistencies in terms of when there is and when there is not interoperability between the different platforms within the broader platformed infrastructures. Principal A went on further to discuss the additional time spent converging all the disparate information into one central document. They described it as:

> …*clunky and clumsy and a massive waste of time*. So, when we do our annual school report, for example, that does pull from Scout, but all the finance stuff, we've then got to go to *different systems* and pull it out and put it back in *manually*. And that is just *massively time wasting and pointless* because nobody really cares about our school report unless you're going for a job. (Principal A, NSW; emphasis added)

To Principal A, the time spent manually inputting financial information into SPaRO was seen as time*wasting* rather than time*saving*, echoing earlier sentiments about the downfalls associated with datafied regimes. Principal A's frustrations appear to come from interoperable irregularities; on the one hand, there are specific mechanisms that draw data from one platform (like Scout) to another platform (like SPaRO), but this occurs in much more of a piecemeal way, rather than consistently. In the process described by Principal A around preparing the Annual School Report (a statutory requirement for NSW government schools as discussed in Chapter 5) there are a number of aspects principals need to attend to and others where there is 'no action required' (DoE, 2024a), since the data is auto populated from a named source (e.g. Scout). Scout data, for example, are used to report specifically on the category *School performance – NAPLAN* within the annual report, and yet action is required for the category of *financial information*, even though the Scout platform also hosts much information around the financial operations within each school. The implication is that if some of the data sharing processes can be automated between platforms, then why cannot all of them be given the large quantities of data that are being stored within these platforms?

The voluminous amount of data available on both Panorama and Scout was referenced to a degree by all participants. Principal D (NSW) spoke about the implications that access to such sheer volume of data can have on the principal:

> …for a principal, the Scout data, there is *so much* on there. And I suppose for some that can be really overwhelming. You know, there is *a lot* of data on there for a principal. (Principal D, NSW; emphasis added)

While Principal D did not express this as a concern for themselves, there was a clear understanding that for other principals, such access could be indeed overwhelming. A secondary issue that comes from managing such a huge volume of data representations is the need to prioritise which areas to action, since principals and their schools simply cannot attend to everything. In Victoria, Principal B reflected on this:

> So, I do use it [Panorama] a lot in working out priorities for the school or where we need to go… You go, okay, well, *we can't do all of these things*… Something I've got better at as a leader is using Panorama to go, okay, what are the two things I'm really going to work on this year? So, let's really concentrate on this and this. (Principal B, VIC; emphasis added)

Once again, we see a need for triaging, but this time from the perspective of the principal. There is a fundamental acknowledgement that not everything presented within the data representations on the platform are able to be addressed. Again, we see leaders prioritising the work that they need to do in their school based on the datafied representations.

The timeliness of the tasks related to the data platforms was an issue for principals, as they described how many of the tasks are related to compliance rather than to enhancing the skills of the individual leader. Principal A (NSW) describes this in detail when asked about the SPaRO platform, which is used to develop strategic planning and annual reporting information:

> SPaRO? *I haven't got anything good to say about SPaRO*. Like, any good principal would have a vision of what their school, they want their school to look like, but the way that you have to put it into SPaRO is so time consuming and so pointless. And because it doesn't talk to any other system, it really is just a time suck. *So, when you go into SPaRO to do anything, you're just doing it for the sake of doing it in SPaRO*. You're not doing it for your own planning, you're not doing it for measuring impact, really. *There's no other real reason to use SPaRO except that you have to at points in time*. (Principal A, NSW; emphasis added)

Here, Principal A raises some important critical questions regarding who the beneficiaries of a platform like SPaRO are. The way they describe a 'good principal' as having that vision of their ideal school, despite the platform, really does call into question the efficacy of these practices when it comes to leadership. If it is not helping the leader to lead more effectively, then what are its purposes? Additionally, and quite critically, school leaders have an enormous task as it is, and

so there is a need to ensure that their time is used on appropriate tasks, and not ones that potentially create work without reward.

7.6 When data discourages…

Ultimately, there were significant moments whereby the platformed infrastructures produced a sense of *discouragement* for the interviewed leaders. There was a feeling of despair experienced by Principal A (NSW) in being held accountable for their data representations, as they believed that it was the mechanisms within the platform that were portraying an inaccurate reading:

> There's a range of third-party programs that do that [collate attendance data]. And then those programs speak to Scout. So, it's not *us* being inaccurate with our role marking. It's the fault of the third parties and how they interact with Scout, which makes it highly problematic. But, you know, *I'm judged for my attendance stuff being out of date, but it's not mine at all*. It's how those two systems talk to each other. (Principal A, NSW; emphasis added)

Here, the principal is identifying that they are being held accountable for their data and yet they remain at the mercy of systems syncing effectively.

Similarly, in the Victorian context, some of the principals found the categories used within the DSPM extremely discouraging for their morale. There was a sense that the method used to categorise school performance was flawed, creating unfair branding of schools based around their datafied results. Principal B spoke about this, stating:

> The one you just talked about before, the differentiated [school performance] report. That's one I really struggle with where you are and your level as a leader, because you can be performing really highly. But because you've gone from a high 95% and you dropped to 93, on attendance, suddenly you are now *Transform*. *Like, it is just the worst report that exists. It is so unfair*. As a leader, look, we look at it. And use it because you get your review based on it. So, you look at it. And I do use it. But at the same time, I look at the transform part, but then I mainly look at the data that says whether we're a high or very high or low. I look at that and go okay, are we improving? Okay, well, or has it gone down or whatever? I don't really look at the Transform. It's the department use, that measure. It's a *terrible* measure, *I think it's really unfair on schools*. Because you can be such a high performing school with your data. But your NAPLAN data might go for one year from 93 to 92, or whatever measure and you get put in *Transform*, like ridiculous! (Principal B, VIC; emphasis added)

Principal B offers some interesting insights into their feelings around the DSPM here. On the one hand, they describe the unfairness of it due to the way in which the performance scores are

calculated. They describe a shift from what they consider to be a high score of 95% down to an equally high score of 93% and how this can recategorise the school performance as being in need of a transformation. Even though the percentage drop is minimal, and the school is arguably still performing very well, the categorisation nonetheless changes how the school performance is perceived in the platform in that moment. On the other hand, in spite of their contempt for such problematic processes, Principal B still uses the DSPM categorisation and the reports as a part of their leadership. This is, in large part, due to the other parts of the platformed infrastructure, specifically policy around undertaking a school performance review. While the use of the DSPM categories in the Panorama reports are not mandated as such, this documentation does specifically inform the methodology for how schools can approach their school performance reviews. Principal B is attempting to disengage from the language associated with the DSPM, even if they are still highly attentive to what the data are doing in the given representations.

There was also a general sense from principals that they did not really know how to use the platforms as effectively as they believed that they should be able to do. As described by Principal B (VIC), 'there's no training, Panorama 101, or spot 101, or anything like that, to show you all the stuff'. For some, a lack of training also led to feelings of disengagement in spite of perceiving themselves to be 'data driven'. Principal C (VIC) spoke about not feeling 'engaged' with Panorama and yet also driven to use it a lot. They said:

> I found, as a leader, I've never really engaged in the platforms properly. But I am very data driven. I would say that I often will manipulate the data in a way that makes sense to me. So, I do use Panorama a lot now. (Principal C, VIC)

In relation to Scout in the New South Wales context, Principal D shared an analogy between Scout and smartphones:

> Look, I probably don't think schools use it [Scout] as well as they could. I liken it to maybe a smartphone, you know, they have all these capabilities, but people probably only use 20% of it right. (Principal D, NSW)

This feeling of not engaging with the platform appeared to be centred around its usage. Other principals also spoke about this feeling of the platform being an unknown 'behemoth' (Principal A, NSW), in which they felt like they only knew a very small part of it.

This lack of understanding was presented in such a way that the leaders saw this as a personal deficit; they felt like their understanding (or lack thereof) with regards to the platform inhibited their success as a leader. Principal C demonstrated this when they said:

> But like, maybe I don't know the scope of what Panorama can do and it's just through sort of playing on it that you get better and better at it. (Principal C, VIC)

There are two important points to make here. The first is that Principal C views their lack of Panorama knowledge as being a downfall in their leadership. They are suggesting that because they do not know the full extent of what Panorama can offer, it is *their fault*. Second, there is an expectation of engaging with Panorama and 'playing on it' to improve their skills overall, instead of being provided with adequate training around correct usage. Again, we have an important impasse here in terms of timesaving: the dashboards are purportedly there to streamline the work of the principal (particularly in the New South Wales context given Scout's timesaving promise), yet they are all essentially left to their own devices (quite literally) to work out the mechanics of all that the data can do. Of course, an important question to ask here is why; why the lack of training materials in how to use these platforms? There is also a responsibilising of the principal to conduct their own training around the platforms and their usage, largely in their own time. Principal G indicated the personal time taken to develop their skills with using the Panorama platform:

> If I go to a network meeting and I pull it up [the platform], people kind of crowd around me to find out what else you can do, but they haven't spent that time on the weekend or whatever. Like, it's very much when you have time or in your own time, and there are no real expectations around it. (Principal G, VIC)

Again, we see a lack of expectation to engage with the platform, yet there is a clear desire to do so from the principals at their leadership gatherings.

There was also a sense of pressure from the comparative metrics that are derived and presented within the data platforms. In Victoria, Principal B described how 'it's much easier for that accountability to take place' with the 'outward looking data' keeping them not just accountable, but also in direct competition with the other schools around them. Principal B discussed the differences in their leadership experiences in different schooling contexts; transferring leadership roles from a rural location to a metropolitan location, they found that the performance metrics mattered a lot more because there were so many more schools geographically closer to one another in more densely populated areas. Of this they said:

> So, therefore, you feel as a leader here much more pressure, and also you feel a lot more pressure because it is highly competitive. (Principal B, VIC)

The implication here is around school choice: in areas where there are greater numbers of schools, there is also greater choice of where parents choose to send their children. This results in schools in a similar locale 'competing' for enrolments through their school's performance measures in public reports provided by Panorama (in Victoria).

Similarly, there was a sense of misuse of the comparative data between schools to formulate goals and targets for school strategic improvement agendas. Principal B explained how, upon inheriting a school strategic plan at their new principal posting, unachievable targets had been set by a previous school leader:

> I'll say here that some of the goals [that] were set *were just ridiculous*. Like, they wanted staff satisfaction or parent or student satisfaction – so, let's say the school was at 50%. And they set a goal of 75%, or something like that. So, a huge leap. But also, what they didn't look at was, well, the state and similar schools might have been at 52. So, no one, no one has ever been at 75. *Like, it just doesn't, doesn't exist*. So, the goal just was not realistic. (Principal B, VIC; emphasis added)

Here, the principal is explaining the role of the comparative metrics in driving improvement targets. They are lamenting that the previous administration of their school did not take the comparative data into consideration when setting their targets in their strategic plan, a practice that they see as a downfall. Principal B continued, stating:

> So, when we're doing the review next term, I'll be saying really strongly to the reviewer as a leader, I might say, 'hey, we're above similar school and state network, I don't want to go from 57 to 58. I just want to maintain 57.' If we can stay above similar schools and network, that's great, we should celebrate that. To try and put us to 65, well, no other school in the state is at that, it's just ridiculous. (Principal B, VIC)

It is clear that the principal is not wanting to experience the same discouragement when their next strategic plan is reviewed. They plan on firmly outlining how the comparative data will be used to support the development of their targets, but that their main goal is to just stay 'above similar schools and network'. Again, this is interesting, as we can see the way that the metrics are shaping how the leader plans to improve their school in the future. However, what remains to be seen is the *how*, something which Principal G points out:

> …it's really interesting, because we're told to do better. Do better, do better. But it's the same thing: *How do I do better?* (Principal G, VIC; emphasis added)

While the dashboards can provide ample information and problems for principals to attend to, they cannot provide the impetus for how those problems should be attended to and importantly, the intricacies behind the data points, let alone what school leaders and their communities should do to facilitate these reforms. The platform might provide a diagnosis but there are arguably no suggestions for what the cure might be.

Principals were also keen to point out the limitations of the data platforms in terms of what it can and cannot say about school performance. Despite these 'billions of pieces of data', there was a strong sense of still needing *more* from the dashboard representations:

> There is no 'why' on Scout. Sure, they will give you billions of pieces of data, including every credit card transaction from any of the twenty credit card holders in your school, you know, they'll give you that kind of drill down data, but there's no 'why'. Absolutely not. (Principal A, NSW)

Principals were clear, then, that the platform only told *part of the story*, and one that was largely devoid of context. They pointed out the explicit need to still humanise the data:

> You want to know, that kiddie who is this outlier in NAPLAN. You want to know that kid's story. You want to know what's going on for them, good or bad. You want to have those conversations with the teachers and ensure that that kid has been catered to. So, you can't do that by sitting in front of the screen looking at your data all the time. (Principal D, NSW)

The fallacy that 'anything that can be measured can be improved' (Muller, 2018, p. 17) is all well and good, provided that the measurable proxies being deployed are in fact directly attributable to the object of analysis. But even with perfect measures and unlimited time, these principals suggested there is still no direct translations from data to policy to practice.

7.7 Discussion: Productions along the horizontal axis

Tracing the productions of the platformed infrastructures along the horizontal axis has allowed for the comparison of two overarching sites in this study, namely Panorama in the Victorian context and Scout in the New South Wales context. While this is somewhat atypical in terms of the scholarly traditions of case study (in terms of case bounding *a priori*) and also the study of educational leadership (in which cases typically focus around a school or individual leader), it is important to note the homologous connection between the two platformed infrastructures in terms of their corresponding positions and structures. As discussed in Chapter 4 (section 4.3), these structures exist largely in the digital space but are nonetheless comparable through their

corresponding placements within their respective State Departments of Education; they share juxtaposing elements at similar policy scales in very similar ways. As discussed throughout Chapters 5 and 6, Panorama and Scout, and their respective infrastructures, have both been influenced by scalar and temporal developments as explored along the vertical and transversal axes. Additionally, a common feature of homologous comparative case studies is the addition of 'nested' comparisons within the cases (Bartlett & Vavrus, 2017). In this chapter, the interviewed principals were treated as 'sub-cases', which allowed for the phenomenon to be investigated across the differing scales, thus 'nesting' within the horizontal axis.

A key point to be made from the analysis in this chapter is that the platformed infrastructures are producing relational constructs between platform and leader, and this shapes how they conduct their leadership work. Specifically, there was a strong sense that the platformed infrastructures were producing problems *for leaders*. In the case of Panorama, there was a perpetual production of problems created specifically through the use of the DSPM; even when principals received high data measures that put them into the high-performing category of 'influence', the only way forward was to take a hit with future categorisations. This is because of the way that the algorithm is structured. Put simply, even if the school maintains these high data measures, the performance would be categorised as static, requiring 'renewed effort to be high performing' (DET, 2021b, n.p.) once again. Similarly, if the data measures drop, then the school will be considered to have a 'strong but declining performance' (DET, 2021b, n.p.), whereby they will be assigned the category 'Recharge' to re-stimulate their data growth trajectories. This is problematic and creates a system whereby continuous high performance as a school (according to the data) is simply impossible.

There were also a number of instances where principals pointed out that the problems being presented within the platforms were problems of representation, rather than being actual problems. This occurred for many different reasons, from interoperable inconsistencies with how and when data syncing would occur between platforms in the broader infrastructure, to issues of data outliers or anomalies that skewed the overall body of data around a particular performance area. For many principals, this occurred with their attendance data; attendance problems were being produced by the dashboard and principals were instructed to attend to this without much additional support regarding how to do so. This is significant as it can lead to other potential impacts on the leader, including the priorities that they are able to set for their school in strategic planning documents. This then has follow-on effects to other aspects of their management practices, like the way that they allocate their budgets to endeavours related to their strategic priorities. In this way, more 'mundane' practices of leadership and management associated with

decision-making, like budgeting, become data practices (Madsen, 2025) through their explicit connection to performance measures.

There was also a significant shaping of how leaders talk about their schools in relation to the platforms and the data therein. Principals used the discourses associated with the platformed infrastructures to describe their school performance across different priority areas. This is where interviewing participants after gathering huge amounts of documented information became quite crucial; principals were speaking a language specific to the platforms and their broader infrastructures. Had I commenced with interviews prior to having a firm grasp of both Scout and Panorama's contents and connections to other policy mechanisms within the broader schooling infrastructure, I would not necessarily have had the ability to follow along with the interview in such a way that enabled quick questioning. Having an idea of the discourses prior to conducting the interviews meant that I was perhaps able to follow principal lines of inquiry more seamlessly. There was probably an aspect too that the participants spoke to me as somewhat of an outsider-insider, given that I was upfront about my prior experiences working in education and leadership.

Importantly, there was a sense of comparison being foregrounded in the language used by the principals. Lewis and Spratt (2024) discuss the benefits that comparison has on our everyday lives but also urges us to consider 'what is *gained* and what is *lost* in the act of comparing' (p. 2, emphasis in original). By incorporating comparative mechanisms into the platforms, principals and leaders can consider their performance in relation to others. However, in doing this, there is also a re-professionalising of the principal to view their schools in very specific ways, as outlined within and by the platforms and their broader infrastructures. Similarly, Muller (2018) proffers how 'the cost of measuring may be greater than the benefits' (p. 3). What is being presented to these principals are effectively problems that need to be addressed. But, it is critical that we problematise these problems, rather than merely accepting them as is, as they have been constructed through the platformed infrastructures. Much like Bacchi's (2009) problematisation of what is the problem represented to be, we need to consider this same question to uncover the hidden logics of the platform – how are these problems being created, and to what end?

7.8 Conclusion

It couldn't help itself. The title of the artwork was telling. Sadly, the robot met its demise in 2019. Those who humanise the robot have romanticised this by implying the robot burned out from exhaustion. However, the artists have said that it was simply a case of running out of hydraulic fuel. Either way, it does offer an interesting provocation. Ultimately, I see parallels with the design of this artwork and the perpetual nature of the platformed infrastructures of Panorama and Scout.

The staging of this piece sees the viscous liquid continually running back out of bounds; there is always work to be done for the robot, much like there are always comparative 'problems' with the data representations to be addressed as a part of the platformed infrastructures. Critically, the parameters of the boundaries for the liquid have been pre-determined by its human creators. That is, they have developed a specific marker based on their own methods to define what constitutes a breeching of the boundaries. Again, these are practices that the platformed infrastructures also partake in; the comparative measures that are used to benchmark schools and their relative performance are dynamic and highly political in nature.

In many ways, school performance has become a 'received idea' (Flaubert, cited in Buchanan, 2017) in that it has become 'an idea that is so well understood it no longer bears thinking about in any kind of critical way' (Buchanan, 2017, p. 458). As demonstrated through the development and evolution of the national schooling infrastructure within Australia, however, such lines of criticality are essential to problematise the very practices that have become so engrained that they are largely indistinguishable. This chapter has demonstrated that there are really complex tensions that exist between data platforms (and their associated infrastructures) and principals. The power here appears to be in using the data representations in Panorama and Scout as thoughtful estimations rather than as accurate measurements of school performance. This means holding ideas in tension with one another, which more experienced leaders appear more comfortable doing. 'Technologies both enable and disable' (Savat, 2013, p. 68), ultimately creating conditions around what can and is said and thought about the object of their analysis. In the case of this thesis, that object of analysis is school performance.

Again, I am not suggesting that we do not need data to understand schools and their relative performances. Measures of accountability are essential for many reasons, including equity considerations, building transparency and supporting the ongoing professional growth within the field. For principals, leading such conversations is important, as is the need for ensuring that such conversations are well-informed by fair and accurate measures and judgements. But it is vital that we keep a critical perspective around what measures are being used to guide such conversations and to what end, which. We need to accept at the outset that even when something is deemed 'good' or 'necessary', there can be ill effects. Even the plant that receives too much sun may die (Colebrook, 2002b). Similarly, curating an (impossible) perfect data platform may well distract (and distort, divert, displace, and discourage) from the core business of schools and school leaders.

Chapter 8: Conclusion(?)

Figure 8.1: *Do It Yourself (Violin)* (1962), painting by Andy Warhol.
From *Artsy*, retrieved from https://www.artsy.net/artwork/andy-warhol-do-it-yourself-violin.
2015 The Andy Warhol Foundation for the Visual Arts, Inc.

Aptly titled and part of a series, the pop-artist Warhol has reproduced a popular item from the era (a paint-by-numbers kit) and has purposefully left the work in a state of incompletion.

8.1 Introduction

In many ways, this thesis feels *non finito,* or intentionally unfinished. Some years ago, there was an exhibition at The Met, entitled *Unfinished: Thoughts Left Visible*, devoted to unfinished art and what could be learnt from it. It boasted incomplete works of art spanning centuries; some were the direct result of life's interruptions; others were stylistically left unfinished. Rembrandt, for example, was often questioned for his seemingly 'unfinished' looking works, to which he supposedly replied that 'a work of art is complete when in it the artist has realised his [or her] intention' (Stamberg, 2016, n.p.). I like to think that this helps me find some form of closure for this thesis (as a document for submission) while also maintaining a degree of openness for future

enquiries to emerge from this research. As Colebrook (2002) reminds us, the 'challenge is to see life as a problem, as a constant proliferation of questions producing ever more complex series of further problems' (p. xxxv). In addition to producing tangible contributions to the field, this thesis has also produced further lines of enquiry to be taken up in future research. The purpose of this concluding chapter, therefore, is to provide an overall summary of the research that has been undertaken, including identifying the various empirical, theoretical and methodological contributions to knowledge, and to also offer insights into possible future enquiries that can grow this specific body of research to make further contributions to the field.

8.2 Summarising the overall premise of the thesis

This thesis has explored the datafied conditions in which educational leaders enact their work; conditions that are deeply influenced and shaped by data platforms and their associated infrastructures. To examine this, I developed three key research questions to drive the overall enquiry: 1) How are datafication logics (re)shaping the technologies, techniques and subjectivities of educational leadership?; 2) How are digital data techniques and technologies (re)shaping leadership temporalities?; and, 3) How are digital data techniques and technologies (re)shaping how leaders know and lead their schools? In this section, I return to these questions to provide an overall summary of the key findings in terms of how the platformed infrastructures produce foundational, temporal and relational conditions that ultimately form the basis for how aspects of educational leadership can be (and are) enacted. I also wish to demonstrate how this research adds to the existing (and underexplored) body of scholarly work that seeks to understand how the logics of datafication and, subsequently, the technologies that are required to enable the actualisation of these logics, are re-professionalising school leaders in their image. *Table 8.1* provides a brief summary of how the research questions have been attended to in the specified chapters using the three axes of Comparative Case Study (CCS) (Bartlett & Vavrus, 2017), in conjunction with the 'thinking with' theoretical frameworks (Jackson & Mazzei, 2012) I developed for this enquiry.

Research Question 1: *How are datafication logics (re)shaping the technologies, techniques and subjectivities of educational leadership?*	**Research Question 2:** *How are digital data techniques and technologies (re)shaping leadership temporalities?*	**Research Question 3:** *How are digital data techniques and technologies (re)shaping how leaders know and lead their schools?*
CCS Vertical Axis (focus on *scales*)	**CCS Transversal Axis** (focus on *time*)	**CCS Horizontal Axis** (focus on *sites*)

Theoretical focus:	**Theoretical focus:**	**Theoretical focus:**
'Thinking with' *groundless grounds* and *recessivity*	'Thinking with' *temporal horizons* and *data hygiene*	'Thinking with' *metric fixation*
Attending chapter:	**Attending chapter:**	**Attending chapter:**
Chapter *5*	Chapter *6*	Chapter *7*
Key findings:	**Key findings:**	**Key findings:**
Platformed infrastructures produce *foundations* for the enactment of leadership, specifically *deferred expertise*.	Platformed infrastructures produce *temporalities* that construct platformed 'presents' through *laundering* mechanisms for leaders to respond to.	Platformed infrastructures produce *relational* conditions between data platforms and embodied leaders, whereby the platform *produces problems* for leaders to address.

Table 8.1: A summary of the core work and findings within each of the analysis chapters in this thesis.

Throughout Chapters 5, 6 and 7, I explored the core productions of the platformed infrastructures around Panorama (in Victoria) and Scout (in New South Wales) as they pertain to educational leadership. I wish to emphasise once again that I did not seek to find neat solutions to what I consider to be highly complex policy situations; rather, my goal was to problematise the very practices occurring by and within the platformed infrastructures to make it possible to think otherwise about how things could be. Importantly, my analyses prompt thinking about how we understand school performance in relation to educational leadership, and the role that digital data techniques and technologies, namely platforms, contribute to such understandings.

In Chapter 5, I considered the foundations for educational leadership that are produced by the logics of datafication in the Australian schooling context. Using the vertical axis of CCS, I traced my analysis of the platformed infrastructures of Panorama and Scout across the various international, national and local policy scales to examine how such foundational conditions have been produced by key policy moments in conjunction with datafication logics. Here, I explained how the foundations for core educational leadership work around school performance revolve around the incorporation of recessive technologies (namely, data platforms) to participate in regimes of leadership. In this way, educational leaders are required to defer expertise over to the data platforms in order to know their schools and associated performances in ways that are conducive to the broader accompanying policy infrastructures. That is, to be an 'effective' leader, one *must* engage with the platformed infrastructures, even when their explicit use is not specifically mandated by policy.

In Chapter 6, I considered the temporalities that are produced by the platformed infrastructures and their impact on how educational leadership is conducted. Using the transversal axis of CCS, I problematised how Panorama and Scout produce their own conceptions of time, particularly in terms of what constitutes the 'present' of school performance. This is important, as it pertains to core leadership work as outlined in school performance policy that privileges particular chrono-logics surrounding past, present and future in strategic planning processes. Critically, the goal is about continually attending to the temporal horizon to focus on futures-oriented planning; that is, setting goals for the near-future, based on datafied information collected in the past and the present. Under these policy logics, the achievement of the goals arguably matters less than the practices of setting goals and the continual looking towards the horizon of 'school improvement', though principals are still held accountable for the temporal 'presents' as represented on the dashboards.

Relatedly, this chapter also attends to practices of data hygiene that are present within the platformed infrastructures, and which make these pasts, presents and imagined futures able to be understood in the present context. I argue that the platforms act as data launderers that take messy and complex information and portray it in such a way that it is accessible for school leaders to participate in strategic improvement endeavours for their school. A key point of data hygiene is the development of specific standards of data 'cleanliness', standards that are developed in specific time-spaces. The platforms contain what are deemed to be standardised representations of what presently matters most in relation to school performance. Examining the two cases of platformed infrastructures along the transversal axis of CCS allow us to consider how the laundered data representations are made to matter in relation to the national context.

In Chapter 7, I examined the relational constructs between principals and platforms to consider the conditions that are being produced here for how leaders are enacting their work. Key to this chapter was understanding the platforms as producers of problems for which principals had to attend. In some cases, these problems were a core part of the platformed infrastructures and sought to produce problems of a perpetual nature through the use of specific algorithms, like the Differentiated Schools Performance Method (DSPM) in the Victorian context. Other times, the problems produced were seen by principals more as problems of representation, rather than being reflective of actual problems (at least from their perspectives). Attendance data was a key example used to highlight this; principals felt that their attendance representations were not indicative of a school-wide attendance problem, *per se*, but were rather a result of interoperable inconsistencies between platforms in the broader infrastructure, or of subsets of students that were significantly

skewing the data. Regardless, principals were still required to attend to these problematic representations and expressed frustration for having to do so.

The pandemic saw edtech explode into education systems throughout the world (Williamson et al., 2021), accelerating the digitisation of education (Decuypere et al., 2021). With the ongoing pandemic conditions created by the COVID-19 virus, it is fair to assume that technological practices are going to remain a central component of school-based work now for some time to come. Arguably, the adaptations necessitated by the pandemic could be come to be seen as the 'greatest edtech experiment in history' (Williamson et al., 2021, p. 118), and thus critical research interrogating this period is invaluable to understand the unprecedented conditions facing schools and societies more broadly. Given that schools are becoming places of increased digitisation, there is little research that specifically examines the discursive practices of principals in terms of digital data technologies (Heffernan & Selwyn, 2023). There should also be concern that the repositioning of edtech as a necessary actor to facilitate learning in times of crisis means that imagining its departure might also become increasingly difficult. With the firm grasp of surveillance capitalism (Zuboff, 2019) persistently diminishing the possibility of an 'exit from digital life' (Pangrazio & Selwyn, 2021, p. 446), it is more important than ever to think critically about digital data techniques and technologies.

Reflecting on the thinking of Deleuze via Buchanan (2000), Colebrook (2002) emphasises that the task is to examine the forces that 'produce the political and cultural terrain, and not just to accept the already given terms of the terrain' (p. xxxix). This is precisely the point of this thesis; to not simply accept the current terms of school performance as objective and a-problematic, but to instead trouble the waters by considering the forces and the organisation principles that have coalesced to produce these notions of school performance in the first place. Problematising the platform responds to Deleuze's assertion that we can 'only really think or respond to problems if we do not accept the current terminology and orthodoxy of our concepts' (Colebrook, 2002, p. xxxv). By rejecting the supposed objectivity of the representations generated by the platform, we can begin to form a meaningful response to the problem.

I agree with Savat (2013), who describes the tendency for us to consider technical objects as separate from humans. As we have seen within the platformed infrastructures around Panorama and Scout, there is a relational component between them that only exists through connection between human and machine. In understanding the human component of the technology (i.e., that a platform is composed of human-made decisions about what is and is not included and how such inclusions are represented), we are better able to problematise the ways in which the technology creates the conditions for knowing and understanding. We commence with the premise that

technologies, such as data platforms, are expressions of the human condition more broadly (Savat, 2013). That is, the platform represents two core things: 1) the importance of measuring school performance through quantified, comparative metrics; and 2) that those measures reflect the aspects of school performance most valorised by society more broadly, or at least the actors who brought the platform into being. There is an assumption that simply changing our language will ultimately overcome the many prejudices that exist in our thinking (Colebrook, 2002). For example, we might think that in reconceptualising 'engagement', which has become notionally coupled with attendance measures, to be inclusive of a broader range of measures will overcome the limitations of thought here. This research demonstrates that this it is not likely to be so straightforward.

This research shines a light on how digital data practices are reshaping how leaders conduct their work. Important to this are conversations around school performance, when and how these are held, and, importantly, if they should be held at all. While these might be considered more 'mundane'(Selwyn, 2022) uses of technologies in comparison to the more commercialised edtech giants that we are seeing infiltrating schooling systems (e.g., Apple, Google, Dojo), platformed infrastructures like Panorama and Scout are nonetheless influenced by similar logics. Importantly, these logics associated with platformed infrastructures are shaping the everyday conditions in which leaders are operating; forming fundamental understandings of how to conduct core leadership work undertaken in schools.

8.3 Contributions to knowledge

The following three sections outline the various contributions to knowledge – empirical, theoretical and methodological – that this thesis makes. It is important to note the interconnectedness of these three sections, as they are inextricably linked with each other. This is due to the foregrounding of theory in this thesis and the important role that it plays in producing the knowledge within this thesis, rather than simply being a guiding framework attended to at the commencement of the research. Importantly, I would like to emphasise again that the significance of this research is that platformed infrastructures produce important implications for how leadership is enacted. The impacts of such 'dataism' is important here on the embodied school leader:

> It does away with the self-reflexive human being and rather radicalises what Edmund Husserl diagnosed 90 years ago as the *Crisis*, i.e., the omission of subjectivity from the sciences in a way that we forget the 'things themselves' of the lifeworld. (Seecamp & Söffner, 2024, p. 80)

This speaks to the real danger of forgetting the individuals that make up the dashboard representations; when we replace the person (i.e., the student) with the number as a proxy, it makes it easier for us to forget the original thing and to subsequently think critically about it.

8.3.1 Empirical contributions to knowledge

While platforms and the platformisation of education has now become a considerable field of study, the focus of these studies has largely been on private edtech companies and their infiltration and normalisation in practices of schooling (see, for example, Kerssens et al., 2024; Ortegón et al., 2024; Williamson, 2022). There has been minimal research on state-level platformed infrastructures currently operating within the Australian context, with notable exceptions including the work of Clutterbuck and colleagues on Queensland's *OneSchool* data infrastructure (Clutterbuck, 2022; Clutterbuck et al., 2023) and Pangrazio and colleagues on the 'patchwork of platforms' being utilised by schools in the Victorian policy space (Pangrazio et al., 2023). Empirically, neither *Panorama* nor *Scout* have been previously studied in the published literature and thus this research offers a novel contribution to the field.

Likewise, as discussed in Chapter 1 (section 1.3), the reshaping of professional identities in light of digital platforms and their broader data infrastructures remains an underexplored area of study (Hartong & Decuypere, 2023), particularly in regards to school leaders (Heffernan & Selwyn, 2023). This thesis aims to contribute to this body of work by specifically exploring how platformed infrastructures influence the work of school leaders. I offer a much-needed glimpse into the everyday practices of school leaders as they navigate policy pertaining to school performance to understand how the platforms shape how they both know and subsequently lead their schools. The importance of decentring the embodied leader in this leadership study is not to be understated; empirically, I focused on developing cases around two platforms and associated infrastructures that are used *within* leadership practices *by* leaders, rather than focusing on the leaders themselves. This was intentionally designed to contribute to the emerging body of research that challenges more conventional views of leadership as an endeavour for individuals (and teams) to undertake. As I hope I have made evident in this thesis, nothing exists in isolation; 'Even technology makes the mistake of considering tools in isolation: tools exist only in relation to the interminglings they make possible or that make them possible' (Deleuze & Guattari, 2013, p. 105).

8.3.2 Theoretical contributions to knowledge

This thesis points to the merits of a theoretical toolbox, specifically the new conceptual terms that can be applied and expanded upon to other studies. As mentioned previously, the field of

educational leadership is much more versed in Foucauldian analyses. Similarly, while there has been a recent uptake in assemblage thinking in policy studies, these have not necessarily realised the complex array of conceptual and theoretical tools available in this field. This is not to criticise the scholarship that has been done thus far but it does perhaps reflect the complexity of assemblage theory more generally, as well as the limited number of methodological tools presently available to support its implementation (exceptions here include Buchanan, 2021; Lewis & Spratt, 2024; Thompson et al., 2023).

What I hope to have demonstrated is the merit of thinkers from other disciplines, and how their theories and concepts can be 'thought with' to produce new understandings within the field of education. An enduring concern of poststructural scholarship is that it offers much in the way of criticality without necessarily offering practical solutions (Niesche & Gowlett, 2019). However, I would argue that scholarship that seeks to disrupt, like this thesis, is highly generative since it can demonstrate a range of creative solutions: 'not becoming *for* some preconceived end, but a becoming for the sake of change itself' (Colebrook, 2002, p. 14; emphasis original). It is rethinking education without an end in sight, rather just embracing a change and trying to do things differently without being concerned about the measurable (read: quantifiable) impact.

8.3.3 Methodological contributions to knowledge

Methodologically, this research has used Comparative Case Study (CCS) (Bartlett & Vavrus, 2017) to explore *digital* spaces of education rather than those existing in the more traditionally bound physical places of school sites. Rather than treating schools or the leaders therein as the core sites for analysis, I have instead focused on developing cases around the digital data platforms that are used as an integral part of leadership work, namely Panorama in Victoria and Scout in New South Wales. In this way I have contributed to the emerging body of research within the field of educational leadership committed to decentring the individual as solely responsible for leadership enactment (Grice et al., 2023). From the 'decentred' perspective, leadership is seen as a complex and continuing process that transcends the individual. Critically, there is recognition in this work of the conditions in which leaders operate, given that their '*practices do not occur in a vacuum*' (Wilkinson, 2021, p. 5; emphasis original). That is, educational leadership practices do not occur on their own devoid of context and are not the 'property of individuals' (Wilkinson, 2021, p. 10), but are subject to the contextual conditions created by policy and practices. In this study, this has meant using CCS to demonstrate the methodological richness associated with both platformed infrastructures *and* educational leadership. Each of these areas are highly complex on their own, and, as such, CCS offers the ability for a sustained treatment across the selected cases.

There is also a specific need for immanent critique when investigating digital technologies and their accompanying policy practices due to the constantly changing nature of these infrastructures (Castañeda & Williamson, 2021). Platformed infrastructures are perpetually changing and developing in response to user activity and feedback, but also to accommodate new methods for data representation. This has been evident with recent changes to school performance reporting in the Victorian context in which an updated version of the Differentiated Schools Performance Method (DSPM) has been developed. Within the updated method, the number of domains has been reduced from the six domains discussed in this thesis (achievement, school climate, student attitude, engagement, senior secondary and participation) to just *two* domains of equal weighting; learning and wellbeing (DET, 2024c). Similarly, the Performance Group categories have also been 'simplified' from *Influence*, *Recharge*, *Renew*, *Stretch* and *Transform* to the four categories of *High*, *Improving*, *Medium* and *Developing* (DET, 2024c). Importantly, while the *language* might have shifted in the platformed infrastructure of Panorama, the *logics* pertaining to the DSPM policy and practices remain unchanged and still demonstrate the re-professionalisation of leadership through the platform.

So, while it is important to describe the various features of individual platforms and software, it is equally important to remember that their current iterations are often surpassed before the analysis has even concluded. Hence, foregrounding the *logics* of platformed infrastructures and illustrating these logics through specific examples from the platforms and associated policies and practices offers a methodology more aligned to the overall relational orientation of this research direction (Decuypere, 2021; Piattoeva & Saari, 2022).

8.4 Further lines of inquiry

As I indicated at the outset of this chapter, this thesis largely feels unfinished, due to the many further questions and lines of enquiry that emerged from the research. In fact, I feel like I am concluding this thesis with more wonderings than I began with, which is probably adding to my angst in it feeling unfinished. Importantly, there is more comparative work to be done. As explained in Chapter 4 (section 4.5), the original intention was to develop three cases along the horizontal axis for comparison; with the third case being centred around a platform-*less* infrastructure built around the policy scape of the Australian Capital Territory's Department of Education. This is still a site of great interest and something which would be beneficial to compare the experiences and practices of leadership in such a platform-less space with those from contexts of platformed infrastructures as discussed in this thesis. There is also the potential for broadening

comparison to include the international level and look at other examples of platformed infrastructures and the extent to which they re-professionalise the leaders in these contexts.

Something that still needs to be considered are the various costs associated with platformed infrastructures. While this thesis has largely examined the 'professional' costs associated with the two platformed infrastructures, particularly in terms of how they reshape the responsibilities of school leaders, there are many other 'costs' to consider. Obviously, there is a financial cost to the development and maintenance of these infrastructures, and this is a cost that comes at the expense of other possibilities. As an example, Education Services Australia (ESA), the company tasked with the development and deployment of national data and assessment systems (including NAPLAN, the NCCD and the NSIP), reported a total expenditure in excess of AUD $32 million per annum in their most recent Annual Information Statement (ACNC, n.d.). If we indeed want to examine schools and schooling systems through an economical lens, then we need to consider the cost of these infrastructures over time, relative to their intended (and actual) outcomes, particularly in the current context of state school underfunding. I deliberately use the term 'intended' here to reflect how policy implementation rarely occurs without unintended consequences, as well as to emphasise that the promoted benefits of platformed governance can often fail to materialise.

Additionally, there are also costs to students in the form of digital harm that comes from data generation about them, who has access to that data and to what end. Specifically, there is the need to further investigate student rights within the platformed infrastructures; how are data being collected on behalf of students (generally without their knowledge nor their consent), in spite of important rights-based documentation, such as the United Nations Convention on the Rights of the Child (UNCRC). While the establishment and endorsement of the UNCRC predates the current digital situation, various comments and articulations have been made in relation to children within digital environments (Beckman et al., 2024). *Article 16* of the UNCRC regarding the right to privacy (UNCRC, n.d.) is especially pertinent here, given the ways in which data representations are used to report on school performance. There are also epistemic injustices here via mechanisms within the platformed infrastructures that erase key information that individualise students and potentially contribute to continuing inequality (Swist & Gulson, 2023).

Another area of critical studies of technology is the impact on the environment. While platforms like Panorama and Scout do not specifically include artificial intelligence (AI) mechanisms right now, the increasing embeddedness of AI in existing platforms demonstrates that such inclusions are certainly a possibility and thus warrant consideration. Now, for example, a simple Google search leads in the first instance to an AI-generated overview of what the search engine believes to be key ideas relating to the search term, which is then followed by the usual list

of recommended websites. As previously discussed, platforms and infrastructures are generally quite dynamic sites of change and constant reinvigoration. This has led towards digital degrowth trends and the ethical implications of using tech for tech's sake in the face of rapid environmental decline. Again, schools are positioned quite precariously here; educators have a responsibility to teach students about environmental decline and sustainability, yet they are doing so via constant engagement with technology and measures that are known to cause direct harm to the environment. Consumption is an ethical issue here, and one that schools, and education systems, must take responsibility for if they are to be educating the future citizens of our democracy.

Substantially, there is an urgent need to reimagine the platformed infrastructure and how it re-professionalises leaders in its image. As this thesis has demonstrated, the digital data techniques and technologies have become embedded in important leadership practices around how we know and understand schools and their performance. Critically questioning *what* is being known, *how* such knowledge is being facilitated and by *whom* remain key lines of further inquiry. It is also crucial to consider the broader systemic implications of recessive technologies in systems of education; particularly how are said technologies affecting the personnel structure of education departments and to what end.

However, a proposed departure from platformed infrastructures could be catastrophic for our national and state education systems given the complexity within which they are entwined in practices of leadership. As Buchanan (2021) reminds us, there is an art of dosages when it comes to change and chaos; one needs to maintain some of the territory to unsettle the ground and make change. I see this as also being true for the platformed infrastructures in education; simply removing them would fundamentally change the way we perceive education and it would require a radical reconceptualisation of how we understand school performance (and, additionally, whether school performance is indeed something that we should be considering at all).

This is far from simple work. The consideration of socio-technical issues like large scale testing regimes (i.e., NAPLAN) and data-driven performance practices (i.e., school performance reports) requires the inclusion of many (often competing) stakeholder voices and perspectives. In the example of platformed infrastructures, this means consultation with and between all members of educational communities, including education professionals (teachers, principals, educational bureaucrats), infrastructure personnel (policy makers, technicians), edtech architects (programmers, CEOs), members of the broader public (parents, allied health professionals) and, quite crucially, with students. We have problematised this through the conceptualisation of technical agonism (Holloway et al., 2023) and have pointed out that although this is important work that needs to be done, there is still a need to recognise the fundamental power and expertise

imbalances in such an approach. Holding all this thinking in tension is complex work but education is itself a complex phenomenon, meaning that complex solutions will always be required.

8.5 Concluding thoughts (for now)

As I draw this thesis (as a document for submission) to a close, I remain open to the possibilities that are still yet to emerge as this research continues well beyond my submission date. Jackson and Mazzei (2013) state that there is 'radical possibility in the unfinalized' (p. 270) and I draw on this notion, alongside Warhol's *Do it Yourself*, to offer myself comfort in being *finished* in the submission sense, but very much *non finito – intentionally unfinished* – in terms of my ongoing research journey, my own ever-receding temporal horizon. By committing to keeping this specific research project open to future moments of 'plugging in' and emerging thought, I subsequently endeavour to keep this research in flux as a dynamic entity. While I take comfort in this on the one hand, this is also a quite unsettling thought; I feel as though I *should* be reaching some sort of finality here in my doctoral journey.

As mentioned at the outset of Chapter 1, I have chosen to make a virtue of the 'middle-ness' of my researcher mindset. I have found myself 'proceeding from the middle, through the middle, coming and going rather than starting and finishing' (Deleuze & Guattari, 2013, p. 27), as opposed to seeking to commence and finalise a project. Rather than merely providing some answers to a pre-defined problem, I hope this thesis also provides inspiration for the field to consider what else could be known and why. The artwork I invoke in this chapter is very much representative of this intention. Warhol's *Do It Yourself* demonstrates the paint-by-numbers kits made popular in the 1960s; however, its broader message is one where the viewer is invited to complete the work originally commenced by the artist. As Deleuze (1995) reminds us, 'a thought's logic isn't a stable rational system' (p. 94).

There are many ways this thesis could have emerged, rather than how it presently stands. I acknowledged my researcher entanglement at the outset precisely for this reason; had I not encountered what I did, read the literature that I did, 'thought with' what I did, and so on, then this thesis likely would have been an entirely different production. The reader is also an important component in this thesis, for each reader will invariably come with their own ontological and epistemological assumptions, which will act as a lens through which the research within is viewed. In this way, this thesis is, and will always be, multiple – a terrifying but also invigorating thought. I invite you to make of it – and make it – what you will.

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Appendices

Appendix 1 – Social media advertisement used for participant recruitment

Appendix 2 – Participant Information Letter

Appendix 3 – Interview protocol

Appendix 4 – Ethical clearance approval: Australian Catholic University

Appendix 5 – Consent form

Appendix 1 – Social media advertisement used for participant recruitment

Appendix 2 – Participant Information Letter

AUSTRALIAN CATHOLIC UNIVERSITY

PARTICIPANT INFORMATION LETTER

PROJECT TITLE: Digital Data Techniques and Technologies: Reshaping the Roles and Responsibilities of School Leaders
APPLICATION NUMBER: 2022-2789
PRINCIPAL INVESTIGATOR: Sarah Langman
STUDENT'S DEGREE: Doctor of Philosophy (PhD)

Dear Participant,

You are invited to participate in the research project described below.

What is the project about?
The research project investigates the use of digital data techniques and technologies being utilised by those in positions of leadership *within* schools (e.g., principals, deputy principals, leading teachers) and in partnership *with* schools (e.g., network leaders, school improvement leaders).

Who is undertaking the project?
This project is being conducted by Sarah Langman and will form the basis for the degree of Doctor of Philosophy (PhD) at Australian Catholic University under the supervision of Dr Jessica Holloway (Senior Research Fellow, Institute for Learning Sciences and Teacher Education, ACU) and Dr Steven Lewis (Senior Research Fellow, Institute for Learning Sciences and Teacher Education, ACU). Sarah is undertaking her PhD after extensive experience working in primary schools in both teaching and leadership positions. Drs. Holloway and Lewis are highly experienced researchers in the field of education policy and have both made significant contributions to the research field in terms of data and technologies.

Who can take part in the project?
This study aims to recruit approximately 30 participants from three specific categories: (i) the *creators*, or those involved with the initial development and/or purchasing of the technologies; (ii) the *implementors*, or those charged with seeing the technologies implemented within the range of department levels for which they are intended; and (iii) the *users*, or those who utilise these technologies as part of their day-to-day work.

What will I be asked to do?
You will be asked to participate in a semi-structured interview, conducted via the videoconferencing platform Zoom at a time most convenient to you. This interview will be recorded and will take approximately 60 minutes of your time.

In this interview, the researcher will ask you questions pertaining to your level of expertise with technical instruments utilised by educational leaders and how these technologies shape the everyday practices of leaders. Questions for participants identified as *users* will include, for example:

- What technical instruments (namely platforms) does the department broadly use to measure school performance?
- Can you describe how you utilise these instruments in your regular leadership work?
- What benefits and deficits can you see from the implementation of these instruments?
- How have these instruments changed how school performance is understood?

- Can you describe a time where the data told you a different story to what you or your staff were perceiving?
- Do you feel as though you can disagree with the data representations on the instruments?

Participants will have the opportunity to ask any questions via email prior to the interview.

Are there any risks associated with participating in this project?
This project involves a very low foreseeable risk of harm. The main risks are inconvenience associated with the time taken to attend an interview, and possibly some mild discomfort in answering some of the questions. Please know that we value your time and will take all reasonable steps to ensure the interview process runs as smoothly as possible. You do not have to answer questions that you are uncomfortable answering, and you will not be identified as a research participant in any of the ensuing research or publications. Participants will be allocated pseudonyms that reference their state or territory and a broad job role title (e.g., *Policy Implementor B, NSW*), however every effort will be taken to ensure anonymity.

Even though there is low foreseeable risk involved in participation, we like to remind everyone that resources are available should any issues arise. Should you need any emotional support, please know that Beyond Blue is always available. Their phone number is 1300 22 4636.

What are the benefits of the research project?
Your participation in this research project may not benefit you directly. However, the outcomes of the research may generate knowledge that will help practitioners and researchers better understand the current conditions that are affecting school leaders, as well as future considerations for technical instruments developed and utilised by state education departments.

Can I withdraw from the study?
Participation in this study is completely voluntary. You are not under any obligation to participate. If you agree to participate, you can withdraw from the study at any time without adverse consequences. On request, any information already obtained that can be linked to you will be destroyed. Participants will have 8 weeks to notify the researcher of their decision to rescind their participation. Your decision to participate or not participate will in no way impact upon your current or future relationship with ACU.

Will anyone else know the results of the project?
All data will be deidentified and only identifiable by state and territory. Given the comparative element of this study, participants will be made aware that they will be identified based on their state or territory, which may impact on the ability for anonymity to be labelled using generic identifiers (e.g., *Policy Implementor B, NSW*). Interviews will be recorded and later transcribed by the researcher along with additional field notes to ensure the accuracy of the findings. Participants will receive a copy of their interview transcript and will have two weeks to suggest edits, clarify comments or redact information. These files will then be stored securely on the ACU server (oneDrive) with password protections. The only people who will have access to the data are the research team members, including the supervisors. Data may be provided to other researchers, however this will only be in non-identifiable form.

Results from this study, including the final thesis and relevant publications resulting from this study, will be provided to participants upon request. It is expected that this study will produce multiple research publications in addition to the PhD thesis, including those in academic journals and conference presentations.

Will I be able to find out the results of the project?

Participants are invited to reach out to the researcher via email should they wish to receive any publications or research findings.

Who do I contact if I have questions about the project?
If you have any questions or require further information, please contact the researcher:
Sarah Langman | sarah.langman@myacu.edu.au | [redacted]

What if I have a complaint or any concerns?
The study has been reviewed by the Human Research Ethics Committee at Australian Catholic University (review number 2022-2789E). If you have any complaints or concerns about the conduct of the project, you may write to the Manager of the Human Research Ethics and Integrity Committee care of the Office of the Deputy Vice Chancellor (Research).

Manager, Ethics and Integrity
c/o Office of the Deputy Vice Chancellor (Research)
Australian Catholic University
North Sydney Campus
PO Box 968
NORTH SYDNEY, NSW 2059
Ph.: 02 9739 2519
Fax: 02 9739 2870
Email: resethics.manager@acu.edu.au

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

I want to participate! How do I sign up?
Please provide your written consent for participation in this project by completing the enclosed consent form. You can return the completed consent form via email in any one of the following ways: (i) by printing, signing, scanning and returning the consent form as an email attachment; (ii) by inserting an electronic signature and returning the consent form as an email attachment; (iii) by sending a reply email indicating your consent to participate in the text of the email; or (iv) by printing, signing and photographing the consent form and sending this as an attachment to the researcher.

Yours sincerely,

Sarah Langman

Please retain a copy of this information letter

Appendix 3 – Interview Protocol

Interview Questions

These questions serve as prompts for interviews with participants identified as relevant *users*, namely those working *within* schools (i.e., principals, deputy principals) and *with* schools (i.e., network leaders, education improvement leaders) who utilise the technical instruments as part of their day-to-day work. As is consistent with the study's methodology, interviews will be semi-structured, allowing for participants to co-construct the material of the interview. They will be provided question prompts, but they will have the freedom to initiate and steer the topics in ways that are specific to their experiences. Interviews should last approximately 60 minutes in duration.

1. Participant background information:

a) Current role
b) Years in current position
c) Previous roles in education settings
d) General feelings about education

2. Department technical instruments:

a) What technical instruments (namely platforms) does the Department broadly use to measure school performance?
b) What do you know about the development or acquisition of these instruments?
c) Can you talk about the initial and ongoing costs of these technical instruments within your own context? (i.e., budget considerations for implementation costs)
d) Can you describe how you utilise these instruments in your regular leadership work?
e) Do these instruments influence how you lead? Explain.

3. Use of the instruments:

a) What benefits do you see from the implementation of these instruments?
b) What deficits do you see from the implementation of these instruments?
c) Who are the primary beneficiaries of utilising these instruments?
d) What have these instruments changed about how school performance is understood?
e) What feedback have you had regarding these instruments?

4. Instrument representations:

a) How do you feel about the data representations on these instruments?
b) Can you describe a time where the data told you a different story to what you or your staff were perceiving?

c) Do you feel like you mostly agree with what you see on the instruments? Why/Why not?
d) Do you feel as though you can disagree with the data representations on the instruments? Why/Why not?

5. Further resources:

a) Are there any other people who could be useful to talk to in relation to this project?
b) Are there any other resources I should be accessing to build an understanding of the technical instruments?
c) Do you have any other comments to add?

6. Feedback:

a) Opportunity for participant to debrief any concerns or queries regarding the project or the interview process.

Appendix 4 - Ethical clearance approval: Australian Catholic University

Sunday, February 12, 2023 at 15:49:07 Australian Eastern Daylight Time

Subject: [2022-2789E] - Ethics application approved!
Date: Monday, 12 September 2022 at 9:00:58 am Australian Eastern Standard Time
From: Leanne Stirling on behalf of Res Ethics
To: Jessica Holloway
CC: Res Ethics, Sarah Langman, Steven Lewis

Dear Applicant,

Chief Investigator: Dr Jessica Holloway, Dr Steven Lewis
Student Researcher: Sarah Maree Langman
Ethics Register Number: 2022-2789E
Project Title: Digital Data Techniques and Technologies: Reshaping the Roles and Responsibilities of School Leaders
Date Approved: 12/09/2022
End Date: 30/08/2024

This is to certify that the above human ethics application has been reviewed by the Australian Catholic University Human Research Ethics Committee (ACU HREC). The application has been approved for the period given above.

Continued approval of this research project is contingent upon the submission of an annual progress report which is due on/before each anniversary of the project approval. A final report is due upon completion of the project. A report proforma can be downloaded from the ACU Research Ethics website.

Researchers are responsible for ensuring that all conditions of approval are adhered to and that any modifications to the protocol, including changes to personnel, are approved prior to implementation. In addition, the ACU HREC must be notified of any reportable matters including, but not limited to, incidents, complaints and unexpected issues.

Researchers are also responsible for ensuring that they adhere to the requirements of the National Statement on Ethical Conduct in Human Research, the Australian Code for the Responsible Conduct of Research and the University's Research Code of Conduct.

Any queries relating to this application should be directed to the Ethics Secretariat (res.ethics@acu.edu.au). Please quote your ethics approval number in all communications with us.

We wish you every success with your research.

Kind regards,

Leanne Stirling
on behalf of ACU HREC Chair, Assoc Prof. Michael Baker

Research Ethics Officer | Research Services | Office of the Deputy Vice-Chancellor (Research)
Australian Catholic University
T: +61 2 9739 2646 E: res.ethics@acu.edu.au

THIS IS AN AUTOMATICALLY GENERATED RESEARCHMASTER EMAIL

Appendix 5 – Consent form

CONSENT FORM

TITLE OF PROJECT: Digital Data Techniques and Technologies: Reshaping the Roles and Responsibilities of School Leaders

APPLICATION NUMBER: 2022-2789

PRINCIPAL INVESTIGATORS: Sarah Langman

I ..... *(the participant)* have read (*or, where appropriate, have had read to me)* and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in the semi-structured, digitally recorded, 60-minute interview, realising that I can withdraw my consent at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me, and that every effort to maintain anonymity will be ensured.

☐ I understand that the appropriate permissions have been sought from my employer by the researcher to participate in this study while maintaining my right to anonymity.

NAME OF PARTICIPANT: .....

SIGNATURE: ..... DATE: .....

SIGNATURE OF PRINCIPAL INVESTIGATOR (or SUPERVISOR):.....

DATE: .....

I wish to have the results of this study, including any publications resulting from the study, forwarded on to me:

Yes ☐ No ☐

If yes, email results to: .....