Developing Teachers' Self-Regulation to Support Stress Management

by

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Declaration of Originality

This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by any other person except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright.

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Statement of Ethical Conduct

The research associated with this thesis abides by the international and Australian codes on human and animal experimentation and was approved by the University of Tasmania's Human Research Ethics Committee (H0015448) and La Trobe University's Human Research Ethics Committee (EC00226).

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Glossary of Terms

Term	Definition
Allostasis	The activation of neural, neuroendocrine and neuroendocrine-immune mechanisms in the face of potentially stressful challenges (McEwen, 1998, p. 33).
Allostatic load	Types of allostatic load include: 1) frequent activation of allostatic systems 2) Failure to shut off allostatic activity after stress 3) Inadequate response of allostatic systems leading to elevated activity of other, normally counter-regulated allostatic systems after stress (McEwen, 1998, p. 33).
Co-regulation	The mutual regulation of physiological state between individuals (or groups) through vocalisations, facial expressions, gestures, and actions (Porges, 2017, p. 9).
Homeostasis	The physiological processes occurring within an organism to maintain a steady state (Cannon, 1932).
Interoception	A process describing both conscious feelings and unconscious monitoring of bodily processes by the nervous system (Porges, 2017, p. 15).
Neuroception	The process through which the nervous system evaluates risk without requiring awareness (Porges, 2017, p. 19).
Self-Reg	A method for understanding stress and managing energy levels (Shanker, 2017, Feb 28a).
Self-regulation	The way our nervous system responds to stress (Shanker & Barker, 2016); How people manage energy expenditure, recovery, and restoration (Shanker, 2022b).
Stress	A state of threatened homeostasis, which is reestablished by a complex repertoire of physiologic and behavioral adaptive responses of the organism (Chrousos, 2009); Something that requires [the body] to burn energy to remain operating at [its] functional best (Shanker, 2017, Feb 28b).
TORSH Talent	A digital platform that serves as a secure video repository and professional learning space enabling collaboration, mentorship, and feedback through various features. For more information about TORSH Talent visit https://www.torshtalent.com/.

Abstract

Teaching is a stressful profession, particularly for those who work in low socioeconomic and/or highly challenging contexts. A chronically stressed teacher is compromised in their capacity to engage effectively with students and colleagues and create the safe, healthy, and challenging learning environments needed for students to thrive emotionally, socially, physically, and academically. So how do teachers learn about stress and apply this knowledge to support their *own* stress management?

This research confirmed the intense stress experienced by teachers and administrators in a low socioeconomic primary school in regional Tasmania, Australia. Using a design-based research (DBR) approach (Anderson & Shattuck, 2012; Crippen & Brown, 2018), cycles of self-regulation professional learning (PL) were provided through workshops and optional video learning conversations (VLCs) enabling a connection between Self-Reg theory (Shanker, 2013; 2020) and teacher self-regulation practice. Mixed methods were iteratively employed and resulting data from questionnaires and VLCs were coded and thematically analysed to inform three research questions. These questions sought to further understand how teachers in this challenging context learned self-regulation; what enabled and constrained their application of self-regulation knowledge and skills; and, how the self-regulation PL influenced their management of stress.

Key findings highlighted factors informing these questions including various significant relationships relevant to effective and ongoing self-regulation PL and the influence of teachers' levels of energy, tension, and overall perception of safety, in determining their capacity to engage in growth-promoting PL. Enabling and constraining factors related to participants' application of self-regulation knowledge and skills were also identified and included personal levels of energy and tension, the capacity to socially engage with others, workload, time, and the demands of contextual stressors.

Consistent with DBR methodology, a set of four design principles embedded in a humanistic approach were identified and tested across three iterations of research providing a starting point for others seeking to engage in self-regulation PL for

teachers in highly challenging contexts. These are supported by models and tools adopted, adapted, and created across the research. This research also had societal implications. Teachers and school administrators with a deeper understanding of the brain/body response to stress and the capacity to apply this learning to support their own stress management, potentiated their own improved wellbeing, in turn positioning them well to support the wellbeing and academic outcomes of their students - a catalyst for positive societal trajectories.

Keywords: teacher stress, teacher PL, video, Self-Reg theory, self-regulation

Chapter 1: Introduction

Teachers' wellbeing and social/emotional competencies support positive student outcomes (Jennings et al., 2021). Teachers who successfully manage their own energy and tension are well positioned to create healthy learning and work environments (Jennings & Greenberg, 2009; Shanker & Hopkins, 2020; Thayer, 1996), fostering wellbeing-enhancing, reciprocal relationships with students (Spilt et al., 2011) and colleagues. The challenge, however, is that teachers face myriad stressors every day (Kyriacou, 2001; Richards, 2012). Some stressors leave them feeling energised, while others leave them feeling depleted (Göksoy & Argon, 2014), angry, tense, frustrated, or depressed (Howard & Johnson, 2004). Reports within the literature suggest that teachers in high poverty schools report higher stress than their colleagues in more affluent contexts (Pierce & Molloy, 1990; Richards, 2012) making them more susceptible to burnout, a "product of stress" (LeCompte & Dworkin, 1991, p. 91). Stressed and burnt out teachers are less likely to build positive relationships with students, manage their classrooms effectively, and meet the social, emotional, and academic needs of their students (Jennings & Greenberg, 2009). So how do teachers, especially those in highly stressful contexts, learn about stress and apply this knowledge to support their own stress management, enabling them to become the prosocial leaders that students need to thrive?

This doctoral research captured the complex and highly stressful nature of teachers' work in a low socioeconomic school in regional Tasmania and explored how the teaching and administrative staff (participants) developed and applied self-regulation knowledge and skills to support their stress management - a pre-requisite for improving student outcomes (Jennings et al., 2021). Over 18 months, I provided professional learning (PL) opportunities grounded in Self-Reg theory (Shanker, 2013; 2020), as I explored *how* participants learned about self-regulation, what *enabled* and *constrained* their application of the learning, and whether the learning supported their management of stress.

This introductory chapter provides an overview of my research by:

- considering stress in everyday life;

- sharing the significance of the research, the research questions (RQs), and the self-regulation PL intervention;
- describing contextual elements of the research and my background as researcher;
- providing a description of the research design and how I prepared for the research;
- giving an overview of the thesis chapters; and,
- outlining potential contributions to the research field.

The Inherent Stress of Life

There is a global climate of rising stress fuelled by various and changing factors (Parenti, 2011; Shah et al., 2021). Current examples include climate change, a world health crisis, political unrest, war, and the fast-paced, economically driven, and media saturated world in which we live (Dubberley et al., 2015). Understanding that "life is by its nature a stressful phenomenon" (Maddi, 2011, p. 296) and that stress is necessary to promote growth (Selye, 1956), we also need to acknowledge that excessive stress has negative impacts (Chrousos, 2009; McEwen, 1998; Selye, 1976a; Shonkoff et al., 2012). Evidence of this can be seen in our communities and schools with increased wellbeing issues and stress-based behaviours (Lilienfeld et al., 2014; McEwen, 1998; Shanker & Barker, 2016). Further stressors can arise in schools with students from low socioeconomic status (SES) backgrounds given the additional stressors they experience (Blair & Raver, 2012; McCoy & Raver, 2014; Simon & Moore Johnson, 2015). In these situations, teachers are often challenged to manage their own stressors whilst supporting other people (students, colleagues, and parents) to manage theirs (Jennings & Greenberg, 2009; Jennings et al., 2021; LeCompte & Dworkin, 1991). Cooper et al. (2001) suggested, "the real issue is not whether there is too much stress or too little stress in people's lives but how we can understand the stress process and its implications for the management of stress" (p. 20). This management of stress – the management of energy and tension from a psychophysiological perspective – is referred to as self-regulation (Burman et al., 2015; Gendolla et al., 2015; Shanker, 2013).

What is Stress?

Stress, as a term relating to a type of response experienced by people, appeared in the psychological literature in the early 1940s (Cooper et al., 2001). This response included the experience of tension, discomfort, or physical symptoms that arose due to one or more stressors, impairing the ability to cope (Lilienfeld et al., 2014; Selye, 1956). Early researchers demonstrated how mechanisms within the body monitored and responded to stressors to maintain homeostasis, creating stability when stressors like tension, infection, or injury were experienced (Cannon, 1932; Gunnar & Quevedo, 2007; Selye, 1956).

Stress is conceptualised and defined in a variety of ways across the literature. Selye (1956) proposed two kinds of stress: distress (negative and debilitating stress) and eustress (positive and growth-promoting stress); while Ungar (2019) suggested types of stress as positive, tolerable, or toxic. There are also various definitions of stress (Cooper et al., 2001). Cannon (1932) described stress as anything that caused internal organs to burn energy in order to maintain internal balance. Building from this definition, and the definition I use for this research, defines *stress* as "a state of threatened homeostasis" (Chrousos, 2009, p. 311) and "something that requires us to burn energy to remain operating at our functional best" (Shanker, 2017).

Excessive stress causes the body's homeostatic systems to adapt affording the best chance of survival (McEwen, 1998); however, prolonged periods of excessive stress can be detrimental to health, affect our behaviour, and inhibit the ability to function effectively (Cooper et al., 2001; Lilienfeld et al., 2014; McEwen, 1998; Selye, 1976a; Shanker & Barker, 2016). Experiencing stress of any kind causes the body to burn energy and can also affect various cognitive functions (Shanker & Barker, 2016; Siegel, 2017; van der Kolk, 2014). It is not realistic, possible, or necessarily even desirable to remove all the stressors from life; however, being able to successfully manage stress supports wellbeing and personal growth.

Arising from the negative connotations predominant within the literature, stress has developed a reputation for being bad, something to be eliminated, something to be avoided (Cooper et al., 2001); yet, stress is essential for growth and development (Lilienfeld et al., 2014; Selye, 1956) and as noted above, it is an inherent

part of life (Gunnar & Quevedo, 2007). For someone to become stronger, they stress their muscles; for someone to become wiser, they stress their cognitive capacities; for someone to make new social connections or strengthen or repair established ones, they stress themselves socially by engaging with others.

Stress is experienced differently by different people (Gunnar & Quevedo, 2007; McEwen, 1998; van der Kolk, 2014). What one person finds stressful, another may not; and what is stressful for someone on one day, may not be stressful for them on another day (Jennings & Greenberg, 2009). Stress that leads to dysregulation is often linked to states of low energy and high tension (Porges, 2011; Thayer, 1996); while states of high energy and lower tension support successful self-regulation and co-regulation (Shanker & Hopkins, 2020; Thayer, 1996; 2003).

Teacher Stress

Teachers are in the 'stress' business. They apply stress to their students to promote academic, physical, social, and emotional growth and have their own experiences of stress (disruptions to homeostasis) as they go about their daily work as educators. The literature provides an historical view into the perpetual issue of teacher stress (Gold & Roth, 2013; Kyriacou, 1987). There are various conceptualisations of teacher stress (Kyriacou, 2011; Prilleltensky et al., 2016), suggested causes of it (Kyriacou, 1987; Timperley & Robinson, 2000), and proposed ways of managing it (Austin et al., 2005; Hartney, 2008; Nagel & Brown, 2003). The literature is sparse on evidence of *how* teachers learn about the body's stress response systems and ways this is applied for personal stress management. This is concerning given the serious consequences of intense and ongoing teacher stress reported as leading to burnout, poor health outcomes, and teachers leaving the profession (Gluschkoff et al., 2016; Kokkinos, 2007).

Teachers are challenged to create healthy learning environments in which all students can be optimally stressed to foster each student's personal growth. Teachers also need to be ready to support these students to navigate and mitigate the many additional stressors that arise threatening students' capacity to learn. For teachers to be well-positioned to take on this challenge, a deeper understanding of the neuroscience of the brain/body response to stress and increased ability to detect

when energy and tension levels are conducive (or not conducive) to learning and engagement might be essential. Historically, the focus of this understanding and application has been on helping students (Jennings & Greenberg, 2009), including pedagogies such as trauma-informed practice (Walkley & Cox, 2013). In this research, the spotlight is on teachers: Will teachers who understand the neuroscience behind stress have increased awareness of their own energy and tension, engage in growth-promoting practices to recognise and respond to stress, and improve their capacity to manage their own stress?

Neuroscience of Stress for Teaching and Learning

The fields of psychology and education have informed each other for centuries. While "psychology studies behaviour, … neuroscience [studies] brain mechanisms underlying behaviour (M.Thomas et al., 2019, p. 478). Advances in brain imaging technology in the 1990s enabled new theoretical advances between neuroscience and education and since this time active exploration of how these fields inform each other has ignited.

In a recent review of progress and prospects of educational neuroscience Thomas et al. (2019) provided examples of projects linking neuroscience and education both directly and indirectly. They described projects directly connecting the two seeking to "improve educational outcomes by enhancing the operation of the brain as a biological organ" (p. 482). These were characterised by attempts to improve brain health or optimise brain function, suggesting lifestyle or environmental interventions. Characteristics of projects indirectly linking neuroscience and education built on "developmental cognitive neuroscience theories to propose and evaluate novel learning activities and their transfer to educational achievement" (p. 483). My research did not fit into either of these categories as it aimed to further understand how increased knowledge and application of the neuroscience of stress can help educators understand their own brain/body response to stress and develop practices to balance energy and tension improving their capacity to manage stress.

There is early evidence of research exploring how the neuroscience of the brain/body response to stress is emerging to inform educators (Lisinski, 2022; Rosati, 2020). This neuroscience highlights structures, mechanisms, and relationships within

the brain that explain self-regulation and dysregulation and further inform how these enable and constrain learning. These findings challenge many traditional perspectives and practices inherent in the teaching profession and invite further investigation on how neuroscientific knowledge can inform educators.

Stress Management

Stress is experienced by each of us differently, and how we go about managing stress is also unique. Strategies for stress management can be growth-promoting (reduce stress with no further negative downstream effects) or maladaptive (reduce stress and potentiate future negative downstream effects). An example of a growth-promoting strategy employed by teachers within the literature was mindfulness (Jennings & Greenberg, 2009; Schussler et al., 2016) while an example of a maladaptive strategy to reduce stress was the over consumption of alcohol or food (Thayer, 2003). The latter example temporarily reduces stress yet suggests negative downstream consequences. Stress management is often viewed through a self-control lens, implying that the stressed individual has access to their neocortex and inferring their capacity to *choose* their action; yet neuroscience provides a different (and complex) picture suggesting that actions are *caused* (Shanker, 2020). I will explore this further in the literature review, as I explain the relationships between different parts of the brain through MacLean's Triune Brain model (1990).

Self-Regulation

According to Burman et al. (2015), the term self-regulation has 447 different definitions. For this research, I used the neurophysiological meaning of self-regulation provided in a glossary on the MEHRIT Centre website (2022b) defined as "how people manage energy expenditure, recovery, and restoration to enhance growth" and "refers to the manner in which the brain maintains physiological stability through complex feedback mechanisms" (Shanker, 2021, p. 1). Self-regulation involves the interplay between sympathetic nervous system (which primes the body for action) and parasympathetic nervous system (which supports rest and recovery) (Porges, 2007; van der Kolk, 2014). Self-regulation occurs in response to stress as the body manages energy consumption and replenishment. Self-Reg theory (Shanker, 2013; 2020) underpinned the PL intervention in this research and was used to support

participants' learning about the brain/body response to stress, increase their awareness of personal energy and tension, and recognise and apply growth-promoting strategies to recover and restore. Application of this learning holds promise for supporting teachers (and their students) with stress management.

Teacher Professional Learning

There is a rich body of research espousing effective characteristics and practices of teacher PL (Avalos, 2011; Borko, 2004; Darling-Hammond et al., 2017; Muijs et al., 2014; Timperley, 2011). Within this body of research, the difference between professional *development* (often one-off or stand-alone presentations) and professional *learning* (ongoing, iterative teacher learning) is made (Clarke & Hollingsworth, 2002; Easton, 2008) and the benefits of ongoing and cyclical learning rather than linear learning are underscored (Thompson et al., 2020; Timperley, 2008). Common characteristics of teacher PL include its social nature (Timperley, 2008) and the trusting relationships that support success (Edwards-Groves et al., 2016; Thompson et al., 2020). The affordances of personalised approaches, for example learning conversations (Earl & Timperley, 2008; 2009; Schuck et al., 2008) and reflection on personal practice captured through video (Major & Watson, 2018; Marsh & Mitchell, 2014; Sherin & Han, 2004; Tripp & Rich, 2012), are evidenced in the literature. Teacher change leading to improved outcomes for students is at the heart of most of the PL literature (Clarke & Hollingsworth, 2002; Timperley, 2008); yet, teacher change prioritising improved outcomes for teachers is less prominent.

Literature describing effective characteristics and practices of teacher PL within highly challenging contexts was difficult to locate. It could be assumed that many of the principles for effective PL carry over and apply to teachers in these contexts; however, as Kwakman (2003) suggested, work stress theory must also be considered, recognising that "stress and learning are mutually related, such that stress affects the participation in professional learning activities" (p. 156). My research concurs with Kwakman's claim describing the interconnectedness of stress and learning. I seek to inform the literature through my exploration of the nature and role of stress and the implications this has on teacher PL in highly stressful contexts as well as further understanding *how* teachers learn about self-regulation, what *enables* and *constrains*

their application of this learning, and the influence self-regulation learning and application has on their management of stress.

Significance of the Research

The impetus for developing teachers' understanding about the brain/body response to stress to support stress management was evident in the rich documentation within the literature of the stressful nature of teaching (Kyriacou, 1987, 2001; Langan-Fox & Cooper, 2011; Shirom et al., 2009). My research commenced in 2018, and its significance was validated throughout the literature with high incidences of reported teacher stress and burnout (Devereux et al., 2009; Gluschkoff et al., 2016; Kokkinos, 2007; Kyriacou, 1987). Unforeseen at this time, was what lay ahead with the global pandemic and the dramatic increase in teacher stress that ensued across the world (Kim et al., 2022; Macintyre et al., 2020; Pressley, 2021). The significance of my research has amplified since its inception four years ago, as stressors have surged for teachers and (in the case of my research site) rates of educational disadvantage have continued to climb (Australian Curriculum Assessment and Reporting Authority, 2019).

Teaching is well-known as a stressful profession with additional stressors for those working in low socioeconomic and high poverty contexts where "teachers themselves can be impacted by their students' trauma presentations" (Brunzell et al., 2018, p. 117). Implications of these increased stressors underscore the critical need to better understand how teachers in low SES schools learn the neuroscience behind the body's psychophysiological response to stress and develop and apply self-regulation knowledge and skills bringing further significance to this investigation. As will be noted in this chapter when I describe the research context, the significance of this research continues. MySchool data from 2021 (Australian Curriculum Assessment and Reporting Authority) further evidenced the ever-increasing rate of educational disadvantage for students within this context, implying no reprieve or reduction of teacher stress.

It has been more than three decades since Kyriacou (1987) presented an international review of teacher burnout and stress; yet, the three justifications for concerns regarding the stress teachers face continue to be valid today. These were:

> (1) the mounting evidence that prolonged occupational stress can lead to both mental and physical ill-health, (2) a general concern to improve the quality of teachers' working lives and (3) a concern that stress and burnout may significantly impair the working relationship a teacher has with [their] pupils and the quality of teaching and commitment [they are] able to display. (p.147)

My research addressed each of these concerns either directly or indirectly as I explored three over-arching research questions.

Research Questions

Three RQs provided an over-arching frame across three iterations of research and provided the structure for the discussion chapter of this thesis.

1. *How* do primary school teachers in a regional low SES school effectively learn self-regulation knowledge and skills?
2. What *enables* and *constrains* their *application* of self-regulation knowledge and skills?
3. How does this learning and application of self-regulation knowledge and skills influence how they manage stress?

To explore these RQs, I collaborated with participants to design PL opportunities. These opportunities formed the intervention for this research.

Intervention - Self-Regulation PL Based on Self-Reg Theory

The PL intervention for this research was informed by Self-Reg theory (Shanker, 2013; 2020). This theory is underpinned by neuroscientific perspectives on how the brain and body respond to stress, for example: MacLean's Triune Brain model (1990); Thayer's theory of energy and tension (1996); as well as Porges' hierarchy of stress and polyvagal theory (2011). Each of these are further explained in Chapter 2. Shanker (2013) conceptualised 5 domains of stress and suggested 5 practices to support stress management, (the management of energy and tension). Self-Reg theory was chosen because it was *not* a program with lessons to be followed promising improved stress management. Rather, I chose it for its neuroscientific foundation and the process it provided to make the research adaptable, inclusive, and responsive to the unique experiences of individuals. Participants were curious about the brain/body response to stress and their curiosities shaped PL content. Self-Reg

theory was the lens used to meet participants' PL requests and was also used to frame discussions about self-regulation practices during the video learning conversations (VLCs).

Research Context

This research was part of a broader Australian Research Council (ARC) funded project conducted collaboratively across three universities – Deakin University, La Trobe University, and the University of Tasmania. Each university had scholarship funding to support a doctoral student. As the scholarship recipient for the University of Tasmania, my research project aimed to inform the broader goals of the ARC funded research. In this section, I describe the funded project, my research site, and my personal background and role as researcher.

Improving Regional Low Socioeconomic Status Students' Learning and Wellbeing

The ARC funded project titled *Improving Regional Low Socioeconomic Status Students' Learning and Wellbeing* commenced in 2016. It was a four-year project investigating "the opportunities, challenges and outcomes of attempts to improve student learning and wellbeing" (Prain, 2017, p. 2) across eight regional low SES schools in Tamania and Vicotria. Collaborating researchers from three universities along with two doctoral students worked with approximately 7,500 students and staff of these schools in their quest to improve student learning and wellbeing using interdependent strategies. These strategies formed five 'pillars' for the research; personalising student learning; the flexible use of learning spaces; team-teaching; the use of digital technologies; and, student wellbeing.

The specific research questions posed by the ARC study were:

(1) What are the individual and combined effects of the proposed strategies on low SES students' academic efficacy, performance, and wellbeing across multiple settings?

(2) What are the effects of these strategies on teachers' and students' practices and beliefs about effective learning and wellbeing?

(3) What do teachers and students perceive as enablers and challenges in these strategies?

(4) What are the theoretical and practical implications of this study for a systemic coordinated approach across service providers to address effective schooling for similarly disadvantaged students?

(5) What are the implications for policy and systemic approaches to like schools with these student cohorts?

The ARC project focused on improving *students'* learning and wellbeing. My research focused on *teachers.* It explored what outcomes might result for teachers who developed and applied knowledge and skills of self-regulation. Then, as a result of this learning, might these teachers be better able to support the learning and wellbeing of their students (Collie, Shapka, & Perry, 2012; Jennings & Greenberg, 2009)?

Research Site

As one of the eight schools in the broader ARC project, the site for my research was specifically selected for its regional location, low socioeconomic demographic, and school focus on wellbeing. Located in the suburbs of Launceston, Tasmania, this primary school was staffed by 30 teachers and 21 non-teaching staff and served 299 Kindergarten to Grade 6 students. Twenty two percent of the students identified as indigenous and 1% as English language learners (Australian Curriculum Assessment and Reporting Authority, 2019). Using data from the 2019 Index of Community Socio-educational Advantage (ICSEA) scale (designed to describe students' level of educational advantage), the low socioeconomic status of the school was confirmed with 88% of the students registered in the quarter of most disadvantage, 12% across the middle quarters (10% + 2%) and 0% in the top quarter. Further records indicated an increasing trend in the level of educational disadvantage from 2016 - with least to most advantage quarters being 78%, 16%, 5%, 1% (Australian Curriculum Assessment and Reporting Authority, 2016) to 2021 - with least to most advantage quarters being 92%, 7%, 1%, 0% (Australian Curriculum Assessment and Reporting Authority, 2021).

Prior to my research, and in response to supporting the complex needs of the students, the school's educators determined their focus on student wellbeing. As my

research began, various initiatives and community partnerships were underway to improve student wellbeing outcomes. Teacher participants welcomed the focus on their own wellbeing in the research I proposed and shared their gratitude for an opportunity to engage in self-regulation PL prioritising their wellbeing.

While these statistics and the school's wellbeing focus provided some information about the context and its priorities, visiting the school provided a deeper insight into the complexity of the context. In Chapter 3, I further describe the context by sharing an excerpt from my journal after my initial visits. This excerpt highlighted additional layers of contextual complexity; layers I understood from my own experiences in similar educational contexts.

My Background and Diverse Researcher Roles

I brought a 27-year history of teaching and leadership within elementary and middle school contexts to this research. This included working in urban and rural settings in both Canada and Australia in a wide variety of roles. A passionate educator, my roles included classroom teacher, specialist Music and Physical Education teacher, School Counsellor, Vice Principal, and Principal. Throughout my career, I engaged in and provided professional development (PD) and PL opportunities. In the last decade, my focus turned to learning and applying Self-Reg theory and witnessing the transformative lens this brought to my practice.

As a result, I prioritised learning about Self-Reg through The MEHRIT Centre, applying Self-Reg learning to my own professional and personal life, and engaging in research centring Self-Reg theory. I focused my master's research on investigating various learning environments and how these inspired (or did not inspire) middle school students to self-regulate (manage their energy and tension) across 5 interrelated domains (biological, emotion, cognitive, social, and prosocial) (Shanker & Hopkins, 2020). This doctoral research followed six years later as I sought to further understand *how* primary school teachers in a low socioeconomic context learned and applied self-regulation knowledge and skills to support their own stress management.

I drew heavily from these experiences, personal learning, and research as I engaged in the various elements of this research. They enabled me to take on a diversity of roles within the research including researcher, Self-Reg PL facilitator,

videographer, and mentor. Although there were many affordances stemming from the intersecting contextual relationships created by my background and my various roles within the research, these also warranted declaration and reflexivity to position myself authentically and openly (Dodgson, 2019) within this research. This reflexivity is discussed further in Chapter 3.

Research Design

This research was based on ontologies and epistemologies of pragmatism, "oriented to the solution of practical problems in the practical world" (Cohen et al., 2011, p. 23) and demanded a research methodology conducive to the pragmatic characteristics of the complex school context. Crippen and Brown (2018) described design-based research (DBR) as "begin[ning] with the exploration, analysis, and subsequent identification of a practical problem that is to be addressed by a designed intervention… within the context of its occurrence" (p. 491). These and other complementary characteristics of DBR, such as the collaborative engagement between researchers and participants, iterative cycles, and "concomitant focus on local impact and theory generation" (Crippen & Brown, p. 490), confirmed my decision to choose DBR as an effective methodological approach for this research.

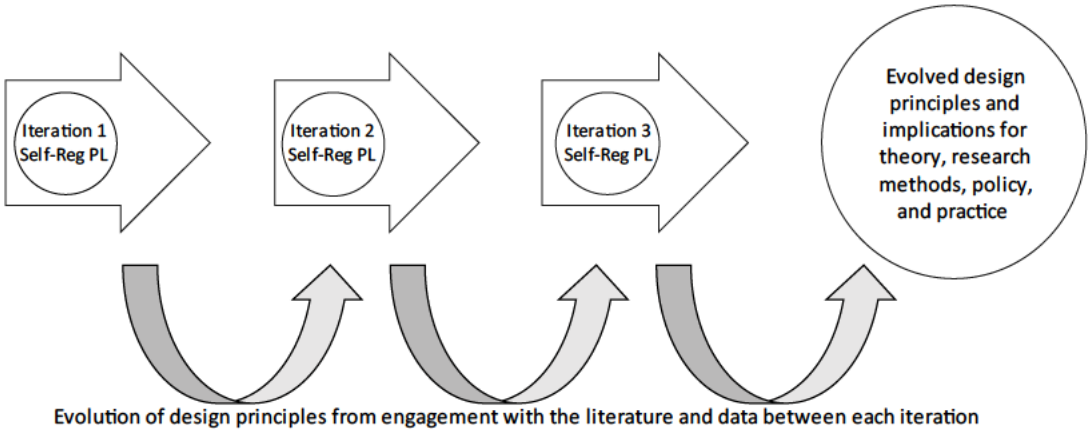
Understanding the problem as teacher stress and how it is managed; addressing this through the designed intervention of self-regulation PL workshops and VLCs; and, applying this within the context of the school (and for VLC participants, the context of their own classrooms), provided the initial scaffold for the research design. The sociocultural context, including "the people, ideas, tools, information, language, history, stories, and documents of a community in a certain place and time" (Crippen & Brown, 2018, p. 490), contextualised the research aligning with Vygotsky's sociocultural theory (Vygotsky, 1978) and Lave and Wenger's (1991) situated learning theory. The various cultural and environmental factors within the context also placed the research in the layers theorised by Bronfenbrenner (1992) in his ecological systems theory.

Therefore, to understand *how* teachers in this low SES school developed self-regulation knowledge and skills, what *enabled* and *constrained* their application of this learning, and how this learning influenced their management of stress, DBR was

employed. Three iterations of self-regulation PL intervention occurred and four design principles (DP) evolved over the course of the research. This evolution of DPs transpired through engagement with iteration data and the literature across the research, but specifically, in the transition from one iteration to the next. Figure 1 represents the iterative design of my research.

Figure 1

Iterative Research Design



Preparation for Research

I prioritised building relationships with participants and students in the year preceding the commencement of the first iteration by immersing myself in the school context. I offered in-class Self-Reg sessions for teachers and students, modelled Self-Reg with students when opportunities arose, and participated in other self-regulation-themed PL alongside participants.

In March and August of 2018, before my official data collection began, I offered a series of in-class sessions on self-regulation. Teachers could opt either for me to team teach with them on a self-regulation topic of their choice, or for me to lead sessions on Self-Reg with their students. I visited all classrooms and worked with almost all teachers and students during these sessions. These classroom visits gave me

deeper insight into the context and its community members, whilst enabling learners and educators to get to know me, build relationships, and establish trust.

Using the theoretical frame of Self-Reg, I established trusting relationships with many participants, fostering a sense of safety in our relationship as highly challenging situations unfolded. I engaged with their students, learned, and used people's names, and experienced the energy and tension within classrooms. My regular presence at the school also enabled connections with administrators, office staff, teaching assistants, custodians, and the groundsperson. I shared my research curiosities, taught about the brain/body response to stress, and, for many, I became a familiar and safe face around the school.

The opportunity to work within learning spaces also enabled me to model Self-Reg. My anecdotal reflections of one of these occasions follows.

On one occasion, during the August visits, a highly dysregulated student was brought to the office at recess and put in a room where he proceeded to throw things around and scream. His exasperated teacher came into the staffroom and shared her frustrations with everyone. I asked if it would be okay for me to engage with him. I knew him from working with him in his classroom, so I was not a stranger. Taking a couple of mandarins from my lunchbox, I headed to the office. Entering the room, I sat down calmly on the floor diagonally across from him, avoiding eye contact and greeting the boy gently using his name. My quiet (and somewhat surprising) presence in the room shifted his energy a little and he sunk to the ground sobbing. I gently reassured him and let him know I was going stay in the room with him so he didn't need to be alone. His sobbing receded and he began to tell me what had happened. I listened.

When he was finished speaking, I offered him a mandarin. He asked what a mandarin was, and I explained it was like a mini orange. I showed him how to peel it and we ate our mandarins together. By this time, his intense dysregulation was over. We began talking about other things, and recognising that recess was nearly over, I helped him think about how he might re-enter the classroom smoothly. We exited the room as students were returning to class. His teacher had been watching through the glass panel in the door and asked, "How did you do that?" This incident became a

conversation point for the teacher and me as we unpacked the various Self-Reg elements that played out.

Self-regulation, trauma-informed practice (Perry & Pollard, 1998), and understanding the brain and stress were all PL topics being explored at the school to address pre-existing student wellbeing outcomes. My interest in attending any school-based PL resulted in many invitations to join in on the multiple learning modes offered. I attended PL on the Zones of Regulation program (Kuypers & Winner, 2011) and the Neurosequential model (Perry, 2009), and the presenters of these reciprocated, by attending the PL I conducted. We connected to each other's presentations to support participants' overall learning experiences; and, while other PL focussed on students, the Self-Reg PL I offered focussed on the participants. The terminology and approaches shared within these PL opportunities varied, some aligning more closely with Self-Reg theory than others. Participants used specific language and responded in specific ways, each reflecting aspects of particular PL experiences. I also attended a public presentation on trauma at the nearby university with participants and other community resource providers.

By engaging with participants within their teaching and learning spaces, I was able to lay the foundations for successful collaboration. I also understood significant pieces of their self-regulation PL journey providing me with a firm foundation upon which to build.

Contributions to the Research Field

Early contributions from this study are already evidenced through publications and conference presentations (Swabey et al., 2019; Swabey et al., 2021), with another paper titled, *Increasing in-service teachers' willingness to be videoed to support professional learning*, currently under review. This research is well-positioned to further contribute due to its current and significant focus on teacher stress management, as well as its inclusion within a broader ARC research project. My research provided a unique perspective on "the opportunities, challenges and outcomes of attempts to improve student learning and wellbeing" (Prain, 2017, p. 2) by focusing on the wellbeing of the teachers through effective PL supporting their development of self-regulation knowledge and skills to improve stress management

This research holds further significance due to the potential contributions it affords in a variety of both general and specific research areas. Examples of general areas include:

- contemporary research methods in education;
- teacher stress and/or teacher wellbeing;
- effective teacher PL;
- using video in teacher PL;
- university-school partnerships in research; and,
- self-regulation.

More specific areas include:

- teacher PL in highly challenging contexts;
- DBR methodology;
- Self-Reg theory-based teacher PL;
- TORSH Talent as an effective platform for storing an annotating video;
- Self-Reg theory for teacher stress management; and,
- VLCs using the VIPP model.

Further contributions to learning theories, the implications of research on policy change, and education paradigms and practice are also avenues for contributions stemming from this research.

Overview of Thesis

This thesis has been structured into eight chapters. The essence of each chapter is briefly described to create an overview of the whole document.

Chapter 1: Introduction

This first chapter introduced the research as I acknowledged the relationship between teacher wellbeing and positive student outcomes and shared how teacher wellbeing is threatened (potentially leading to burnout) due to the highly stressful

nature of teaching in challenging contexts. I suggested that teacher PL about stress and how to manage it using Self-Reg theory held potential to address this. In this chapter, I also described the significance of the research, contextual elements, the research design, and how I prepared for conducting the research. I concluded the chapter by suggesting potential contributions to theory, research methods, policy, and practice stemming from this research.

Chapter 2: Literature Review

In this chapter, I contextualise the key topics underpinning this research; stress, self-regulation, and Self-Reg, before reviewing the literature on teacher wellbeing and student outcomes, teacher stress, and effective teacher PL. I continue reviewing key literature to describe and justify the initial design principles for this research. I conclude the chapter by describing how this research offers to further inform the literature through addressing some of the gaps noted.

Chapter 3: Methodology

In Chapter 3, I focus on the methodology for this research. This chapter considers the research approach and research design. The phases and characteristics of DBR methodology are outlined and described according to how these framed my research. I also discuss data collection and analysis in this chapter.

Chapter 4: Iteration 1 Findings: Engaging With Neuroscience

Iteration 1 findings are the focus of Chapter 4. In this chapter, I outline what occurred leading up to, during, and at the conclusion of Iteration 1 across the various components of research. Data from the Iteration 1 PL session exploring the neuroscience, three VLCs, group discussion and questionnaire are shared, and I conclude the chapter by considering implications for Iteration 2.

Chapter 5: Iteration 2 Findings: Exploring Self-Reg Strategies and Video PL

Following a similar structure to Chapter 4, in Chapter 5, I outline what occurred leading up to, during, and at the conclusion of Iteration 2 across the various components of research. I share data from the Iteration 2 PL session exploring Self-Reg strategies, four VLCs, and the questionnaire. Once again, the chapter concludes with implications for the subsequent and final iteration.

Chapter 6: Iteration 3 Findings: Applying the Learning

I share the findings from the final iteration in this chapter. Again, I outline the pragmatic, reflexive, and scholarly ways I prepared and communicate key findings from the PL session focussed on reviewing and applying the learning, five VLCs, and the final questionnaire.

Chapter 7: Discussion

In this chapter, I provide the context and frame for discussing my findings. I begin with a summary of my research, the research questions (RQs), and the methodology. Each RQ is subsequently addressed through my findings, the literature, and the evolution of relevant DPs. I conclude the chapter by considering aspects of PL trajectories and the unique learning paths of participants.

Chapter 8: Conclusion

In this concluding chapter, I reflect on what I set out to understand through this research and share the scientific, practical, and societal outputs (Herrington et al., 2007) afforded through the DBR process. I share the evolved DPs, and other key insights from the research. I describe the implications of this research on theory, research methodology, policy, and practice and conclude by considering the limitations of the study and future research trajectories.

Chapter 1 Summary

In this introductory chapter, I established and justified the significant need to develop teachers' self-regulation knowledge and skills to improve their management of stress for their own wellbeing (and for the wellbeing and academic success of their students). This need was underscored for teachers working in high stress contexts. I also provided information about the context of the research (both where it fits within the ARC project and site-specific details), my background as researcher, and the research design in this introduction. The chapter concluded with potential research contributions stemming from by this investigation and an overview of the chapters in this thesis.

Chapter 2: Literature Review

In Chapter 1, I introduced this research, explained its significance, and described the research design. I shared important contextual elements of the research and my own background as researcher. In developing teachers' self-regulation to support stress management through PL interventions, I sought to address a gap in the literature to gain a deeper understanding of *how* participants learned self-regulation, what *enabled* and *constrained* their application of the learning, and whether the learning supported their management of stress. The design-based research (DBR) methodology (detailed in the following chapter) demanded ongoing engagement with the literature to identify, test, and refine design principles (DPs), to support others seeking to engage in effective teacher PL on self-regulation in challenging contexts. I concluded the first chapter listing potential contributions to various fields of research and providing an overview of what each chapter contains.

This chapter is divided into four sections. The first section provides literature-based contextualisation and essential understandings for this research. The topics covered in this section include:

- stress;
- self-regulation; and,
- Self-Reg.

Then, I review of literature on:

- teacher wellbeing to student outcomes;
- teacher stress; and,
- teacher PL.

This is followed by the literature I reviewed to identify the initial DPs:

- DP1: Establish and maintain professional relationships;
- DP2: Ensure relevant and effective dissemination of knowledge and skills;
- DP3: Apply new learning often and across contexts; and,
- DP4: Engage in feedback with others (including feedback through video use in teacher PL)

I conclude the chapter by sharing the gaps within the literature that this research seeks to address.

Conceptualising Stress, Self-Regulation, and Self-Reg

> Life exists by maintaining a complex dynamic equilibrium, or **homeostasis**, that is constantly challenged by intrinsic or extrinsic adverse forces or **stressors**. **Stress** is, thus, defined as a state of threatened homeostasis, which is reestablished by a complex repertoire of **physiologic and behavioral adaptive responses** of the organism (Chrousos, 1998, p. 311).

Stress

Stress is one of the key themes of this research. It is a complex and fascinating construct that has become interwoven in our lives and is experienced differently by individuals in both positive and negative ways. Participants in this research claimed high levels of toxic and ongoing stress inherent to the context of their school, making it essential for me (and now others reading this research) to have a foundational understanding of the psychophysiology of stress and the stress response. As a career long educator, not a neuroscientist or medical practitioner, I was not well positioned to *review* the stress literature; however, I drew from it to further understand the history of stress, what stress is and the body's response to stress. In this way, I established what was important and useful for me to understand as I supported teachers in developing self-regulation knowledge and skills to improve their stress management through teacher PL. By learning the history of stress and how the brain and body respond to stress, I was able to apply this understanding to my research. Therefore, to begin this chapter, I provide information about stress, rather than a review of literature, to support the readers' understanding of concepts and theories that appear in the findings, discussion, and conclusion of this thesis.

The History of Stress

This thesis opened with a glimpse into the inherent stress of life (Maddi, 2011; Selye, 1956) explaining how stress is fundamental to growth and development (Selye,

1956); yet, in excess, it can be detrimental to wellbeing (McEwen, 1998; Selye, 1976a; Thayer, 1996). This psychological conceptualisation of the term *stress*, attested in 1955 (Online Etymology Dictionary., n.d.) with continued prevalence today, spawned from the concept of stress related to the physical pressures on structures and materials stemming from ancient Roman times (Robinson, 2018). In his webinar titled, *Stress in today's world*, Shanker (personal communication, January 28, 2022) offered other terms sharing the same history including *strain*, *resilience*, and *pressure,* all relating to the internal properties of a substance prevalent in the 16th century.

Early conceptualisation of stress related to the human body occurred through the work of various psychologists (Bernard 1813-1878, Cannon 1871-1945, Lazarus 1922-2002) and medical practitioners (Osler 1849-1919, Selye 1907-1982) in the 19th and 20th centuries. Similar to the 16th century engineering references of stress suggesting internal properties of building materials and structures, French psychologist Claude Bernard (1872), considered the *milieu intérieur* (translated as the environment within) of the human body, and theorised how the body regulated and balanced its internal environment. Then from the internal environment to the external environment, Sir William Osler (1921) proposed that the external environment and a person's disposition had an effect on their wellbeing. In a series of lectures Osler delivered on the evolution of modern medicine, he referenced Galen (a Hippocratic disciple) known for making "war on the theoretical practitioners of the day, particularly the Methodists, who, like some of their modern followers, held that their business was with the disease and not with the conditions out of which they arose" (1921, p. 82). Osler linked some of these environmental and lifestyle conditions to disease, such as relentlessly hard working businessmen accounting for many of his heart disease patients, affording inferences of the connection between environment/conditions and disease (Robinson, 2018).

Cannon (1932) further developed Bernard's proposition of the *milieu intérieur* (1872), by noting the "natural experiment on the psychological impact of extreme stress" (Robinson, 2018, p. 336) that war provided. He also investigated traumatic shock and hormonal responses to fear. Cannon coined the term *homeostasis* to describe the physiological processes occurring within an organism to maintain a

steady state, as well as the terms *fight* and *flight* to describe an animal's response to threat and the activation of the sympathetic nervous system, priming the system to respond (Fink, 2010); yet, interestingly, the term *stress* did not feature in his research.

Hans Selye 1907-1982, known as the *father of stress* (Fink, 2010), was responsible for adopting the term *stress* from its physics and engineering roots. He defined stress as "the nonspecific response of the body to any demand made upon it" (Selye, 1976b, p. 137) and further described stress as the "mutual actions of forces that take place across any section of the body, physical or psychological" (Selye, cited in Robinson, 2018, p.338) and his research determined phases of the stress response and, building on Osler's (1921) inferences, provided evidence of the relationship between chronic stress and poor health. Richard Lazarus (1922-2002) challenged Selye's stress response theory (Selye, 1956) suggesting that different individuals vary in their interpretation, appraisal, and response to stress (Lazarus & Eriksen, 1952).

Currently, there is a rapid increase in technological advances in medicine and neuroscience that contribute to a deeper understanding of the body's internal mechanisms. These advances demonstrate how our brain and body respond to external and internal stimuli in order to respond to the disruption of homeostasis stress creates. (Bellert & Graham, 2013; M. C. S. Thomas et al., 2019; van der Kolk, 2014). There is also evidence of the emergence of neuroscience in teacher PL, as teachers capitalise on these new insights (Anderson et al., 2018) and increasingly recognise it as an important field to inform practice (Ng, 2018).

Stress and the Body

Medical and neuroscientific literature delved deeply into the complexity of the body's stress response system investigating structural, chemical, systematic, and probabilistic epigenetic aspects (Gottlieb, 2007; Gunnar & Quevedo, 2007; Russo et al., 2012), much of which went well beyond the realms of what may be useful for school teachers interested in improving their management of stress through self-regulation. Research that offered global understandings, and in some cases metaphors, made key understandings accessible and applicable for school-based educators (Bellert & Graham, 2013; Shanker, 2020; Whiting et al., 2021). Gunnar and Quevedo (2007) provided both global understandings and neuroscientific details of

how the body responds to stress through the “activation of neurobiological systems that preserve viability through change or allostasis” (p. 145). Allostasis or “stability through change” (Sterling, 1988, p. 631) was “an essential component of maintaining homeostasis” (McEwen, 1998, p. 33). The literature described the complexity of stress response systems involving the central nervous system and peripheral organs (Chrousos, 2009; Porges, 2007; Sapolsky, 2017; Selye, 1956; van der Kolk, 2014) and the overall purpose of the stress response in re-establishing homeostasis (Cannon, 1932; Chrousos, 2009).

The Stress Response System.

Sapolsky (2017) described the relationships between the structures in MacLean’s (1967) triune brain model as well as the two branches of the autonomic nervous system (ANS): the sympathetic nervous system (SNS), activated to communicate threat from the limbic part of the brain to prepare the reptilian part to spring into action (fight, flight, freeze); and, the parasympathetic nervous system (PNS), responsible for recovery, repair, digestion, and “calm, vegetative states” (p. 27). He described the opposing roles of the SNS and PNS: “The SNS speeds up the heart; the PNS slows it down. The PNS promotes digestion, the SNS inhibits it” (Sapolsky, p. 27). If threat is detected, the SNS primes to respond, while simultaneously inhibiting neocortical functions compromising language, problem solving, learning, and metacognition (Shanker, 2020). Other systems of the body are also affected, for example, the inhibition of the digestive and immune systems occur as all available resources are directed to ensure survival (Chrousos, 2009; Sapolsky, 2004). Re-engagement of the neocortex only resumes once the perception of threat has dissipated and the limbic alarm is soothed (Porges, 2011; Shanker, 2020).

Outcomes of the Stress Response System.

The literature provided various categories of stress and potential outcomes of the body’s response to stress. For example, Sapolsky (2004) suggested three kinds of stress: acute physical crisis, chronic physical challenge, and psychological and social disruptions (p. 4), while Ungar (2019) categorised stress as positive, tolerable, and toxic (pp. 48-49). In seeking a return to homeostasis, Chrousos (2009) described three possible outcomes of the stress response: eustasis (a return to homeostasis);

cacostasis (dyshomeostasis); or hyperstasis where “the organism gains from the experience and a new, improved homeostatic capacity is attained” (p. 375).

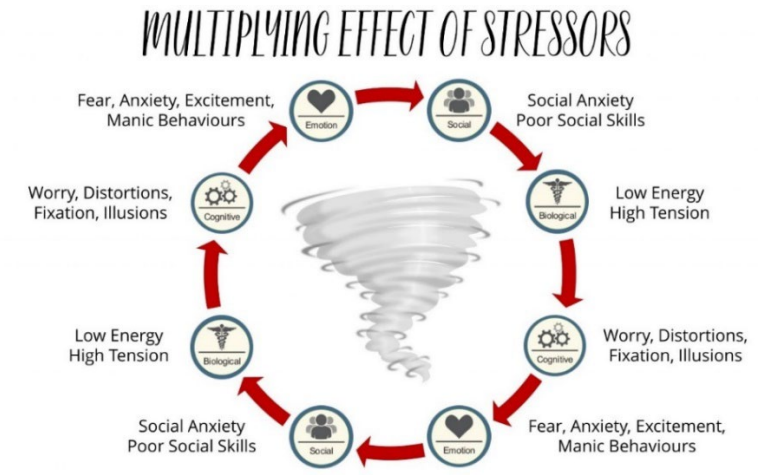
Affordances of “optimal basal activity and responsiveness of the stress system” (Chrousos, 2009, p. 374) included: wellbeing; successful social engagement and task performance; and, an increased capacity to adapt (McEwen, 2004), be resilient (Russo et al., 2012), and learn (Shanker, 2013). Chrousos argued that manifestations of “excessive or inadequate basal activity and/or responsiveness of the stress system, in terms of both magnitude and duration, might impair growth, development and body composition, and might account for behavioral, endocrine, metabolic, cardiovascular, autoimmune, and allergic disorders” (p. 377). The evidence of “wear-and-tear” (McEwen, 2004, p. 1) on the body from enduring stress was well documented within the literature, with a plethora of examples of negative health outcomes (Chrousos, 2009; McEwen, 1998; Sapolsky, 2004; Selye, 1976a).

Stress Cycles.

Enduring stress resulted in stress cycles, where stressors built upon and fuelled each other, increasing and compounding stress, creating allostatic overload (Chrousos, 2009; McEwen, 1998; Sapolsky, 2017; Shanker & Barker, 2016). Chrousos described how this “vicious cycle is initiated and sustained, in which behavioral maladjustment leads to psychological problems in family, peer group, school and/or work, which sustain or cause further mediator changes and exacerbate behavioral maladjustment” (Chrousos, p. 378). Figure 2 shows the stress cycle and how stressors across five domains (biological, emotion, cognitive, social, and prosocial) fuel each other (The MEHRIT Centre, 2021a).

Figure 2

The MEHRIT Centre's Multiplying Effect of Stressor Graphic



From "Multiplying Effect of Stressors," The MEHRIT Centre, 2020 (https://self-reg.ca/wp-content/uploads/2020/08/Multiplying-Effect-of-Stressors-scaled.jpg)

This stress cycle was noted by Shanker and Barker (2016) as a cycle that occurred not only for an individual but also between people– each adding to the others' stress load and sometimes resulting in conflict. They note, in the case of a child and parent,

> Any stressor in any domain can trigger a stress cycle, but a child is most vulnerable when in a low energy/high tension state. Once the stress cycle is tripped, the threshold drops for a stress response in any of the other domains, meaning the child becomes more reactive, and the number of issues escalating the child's arousal response grows exponentially (2016, p. 82).

They continue to note how it can be difficult for the adult to remain calm as their own hyperarousal escalated along with the child's. This scenario described by Shanker and Barker between a child and parent was also applicable to a teacher and a student, or between adults, or children. As pointed out in the scenario, increased energy to fuel the stress response was demanded due to the increasing tension, leaving those in the scenario in a downward spiral of a low energy and high tension. Restoration, which supports the increase of energy and the lowering of tension, is required to recover.

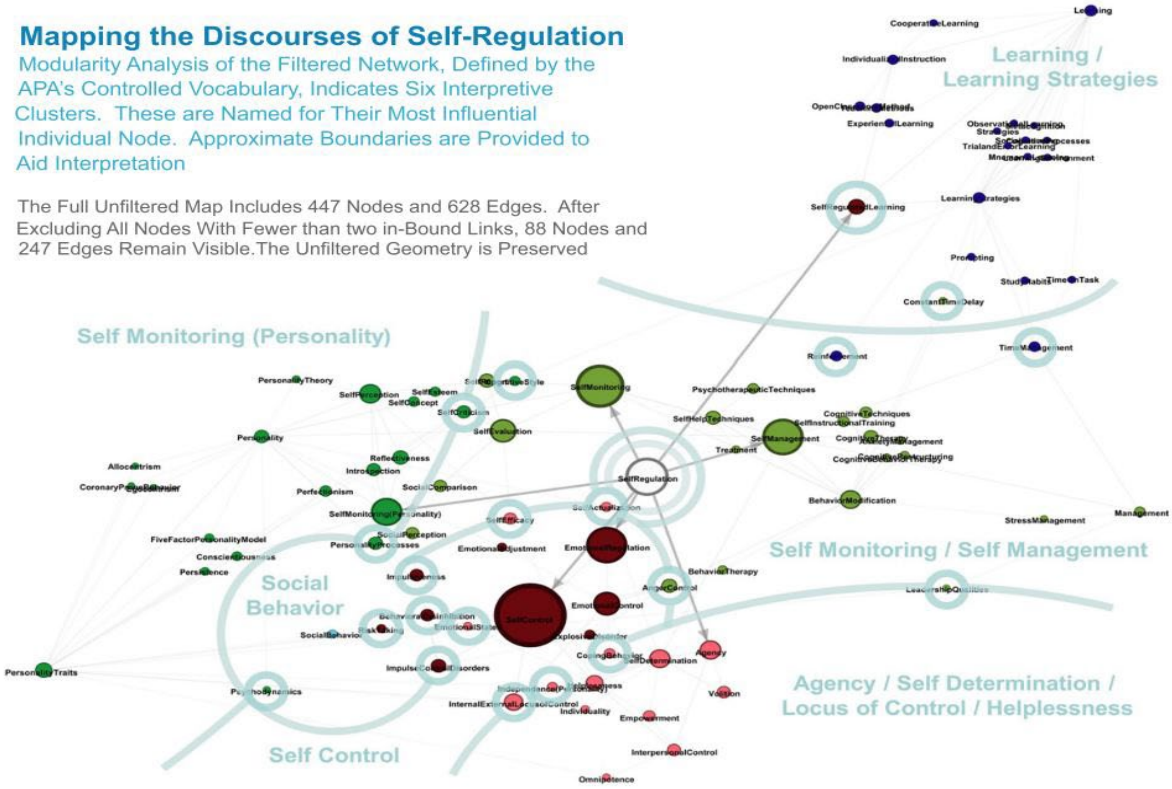
Self-Regulation

In the previous section, I used the literature to provide an overview of stress as a foundation for exploring the concept of self-regulation used within this research. In this section, I explore the literature within educational research on self-regulation before describing Self-Reg theory.

The term *self-regulation* is both popular and ambiguous (Boekaerts et al., 2005) and its use within the literature varies significantly resulting at times in "different partial interpretations [conflicting] as strongly held visions of the same fundamental phenomena" (Burman et al., 2015, p. 1508). Burman et al. provided clarity on the various uses of the term by mapping self-regulation discourses. Although some of the print in Figure 3 is too small to read, I have included Burman et al's mapping of self-regulation discourse to demonstrate the term's diverse usage and the need to clearly define how it is being used.

Figure 3

Burman et al's (2015) Mapping the Discourses of Self-Regulation



From "On the Meanings of Self-Regulation: Digital Humanities in Service of Conceptual Clarity," by J. Burman, C. Green, and S. Shanker 2015, *The Australian Journal of Teacher Education, 86*(5), p.1515 (https://doi.org/10.1111/cdev.12395)

Burman et al. (2015) identified 447 associated terms, synthesised them into 88 closely related concepts, and then distilled these into six conceptual clusters. These broad overlapping clusters included:

1. Learning/ Learning strategies;
2. Self-monitoring/ Self-management;
3. Agency/ Self-determination/ Locus of control/ Helplessness;
4. Self control;
5. Social behaviour; and,
6. Self-monitoring (personality). (p. 1514)

As a result of their study, Burman et al. (2015) suggested clearly communicating the cluster(s) that research or work targeted, to avoid ambiguity and allow for meaningful discussion about self-regulation to occur. My research intervention sought to develop teachers' self-regulation through effective PL. Therefore, of particular relevance to my study are the two clusters: Learning/ learning strategies – exploring some this cluster's cognitive self-regulation aspects; and, self monitoring/ self management – exploring some of this cluster's biological self-regulation aspects.

Self-Regulation – Cognitive

Evidence of the human quest to regulate thinking can be seen in Plato's philosophical studies with his suggestions of training the mind to be stronger than the body and referring to impulses and urges as "wild horses" (Shanker, 2020, p. 45). Suggestions of strengthening 'will' to resist temptations or change temperament evident in ancient Greek times, were picked up by early Christians, where 'willpower' provided common themes in stories like that of Adam and Eve (Shanker, p. 60). In the 20th century, cognitive psychology depicted a mechanistic view of self-regulation (likely connected to the 16th century engineering roots of the conceptualisation of stress) with heavy focus on self-control and cybernetic principles (Gendolla et al., 2015). Self-regulation from a predominantly cognitive lens also received increased attention and reinvestigation, evidenced by the various editions of the *Handbook of self-regulation: Research, theory, and applications* (Vohs & Baumeister, 2007, 2010,

2014, 2016). The idea of self as an active agent and not a machine was promoted by Bandura (2006) and more recently, developments in the studies of self-regulation consider it through a biological lens (Gendolla et al., 2015).

Self-Regulation – Biological

Ancient Greek times provided evidence of biological self-regulation. Hippocratic doctors sought balance between the four humours: sanguine (blood); melancholic (black bile); choleric (yellow bile); and, phlegmatic (phlegm) in an effort to achieve homeostasis to manage temperament and other ailments (Shanker, 2020, pp. 56-57). Good health suggested a balance of these humours. The term *homeostasis* was coined by Cannon (1932) who explained it in terms of the body's mechanisms, activated to preserve the constancy of the body's internal environment, or "*milieu intérieur"* (Bernard, 1872). More recently, self-regulation in a biological sense, was described as the way our nervous system responds to stress (Shanker & Barker, 2016).

Self-Regulation in the Literature

There is incongruency within educational literature centred on self-regulation due to the varied definitions. Some researchers conceptualise self-regulation in terms of cognitive and executive function focus (Hattie & Timperley, 2007; Schunk & Ertmer, 2000; Zimmerman, 2000; Zimmerman et al., 1996), while others frame self-regulation as a biological phenomenon with emphasis on brain/body mechanisms (Lisinski, 2022; Rosati, 2020; Shanker, 2013). Further examples of these variations from the field of education included research on self-regulated learning (Menzies & Lane, 2011; Pelco & Reed-Victor, 2007; Schapiro & Livingston, 2000), environmental impacts on self-regulation (King et al., 2013; Roy et al., 2014), interventions and strategies (Boekaerts & Cascallar, 2006; Menzies & Lane, 2011; Pelco & Reed-Victor, 2007), self-regulation at different ages (Causadias et al., 2012; King et al., 2013), and self-regulation from an executive functioning point of view where the ability to set goals and prioritise and manage tasks is studied (Effeney et al., 2013).

Common across the educational research on self-regulation (regardless of how it was conceptualised) was the focus on student subjects rather than teachers. Examples of this can be found within educational literature on trauma and its effects on a child's ability to self-regulate (Perry, 1995, 2009; van der Kolk, 2005, 2014). This

child-centric focus was also evidenced through the plethora of programs available to teachers and schools, (for example: *The Zones of Regulation* (Kuypers & Winner, 2011) and *MindUp* (Hawn Foundation, 2011), and many others (with various degrees of research-based evidence behind them) to support students.

Literature investigating self-regulation with teacher subjects was harder to locate, although beginning to emerge (Lichtinger & Leichtentritt, 2016; Rosati, 2020), with the topic of teacher stress being the closest source of understanding informing this field (Klassen & Chiu, 2010). The theory I selected for this research, for its capacity to inform teachers of the psychophysiology of self-regulation to enable them to develop their understanding of self-regulation to improve stress management, was Self-Reg (Shanker, 2013; 2020; Shanker & Hopkins, 2020).

Self-Reg

Distinguishing it from the 447 other definitions of self-regulation (Burman et al., 2015) and affording an accessible format for educators (Shanker & Hopkins, 2020), Self-Reg theory (Shanker, 2013; 2020) provided a structure for learning theoretical knowledge about the brain/body response to stress as well as a process for applying this to support the management of energy and tension. Self-Reg, described as "a method for understanding stress and managing energy levels" (Shanker, 2022c) considers stress under five distinct, yet interrelated domains. The 5 domains are:

- the biological domain - including "physical health, sleep, nutrition, exercise, and various aspects of maintaining energy, including the role the nervous system plays in regulating energy levels" (Shanker & Hopkins, 2020, p. 17);
- the emotion domain – recognising the energy and tension of strong emotions both positive and negative;
- the cognitive domain – where "processing various kinds of information, maintaining attention, dealing with time pressures, and the demands of the working memory" are considered (Shanker & Hopkins, pp. 18-19);
- the social domain – "recognizing social cues and the effect of behaviour on others, understanding and responding to the feelings and intentions of others, communications skills, and the ability to repair and restore relationships" (Shanker & Hopkins, p. 19); and,

- the prosocial domain – “coping with other people’s distress, a sense of justice/injustice, and the ability to co-regulate with others and put their needs and interests ahead of one’s own” (Shanker & Hopkins, p. 20).

Although these domains are clearly delineated in these descriptions, they work in concert together, impacting each other. Self-Reg theory (Shanker, 2013; 2020) encourages the detection of overt and hidden stressors across the 5 domains. An example of an overt stressor in the biological domain is a broken leg, it is obvious for others to see; while a hidden stressor in the biological domain might be difficulty hearing, something that the observer may not notice. The theory also describes the depleting and potentially harmful nature of negative stress as well as the growth-promoting and invigorating nature of positive stress.

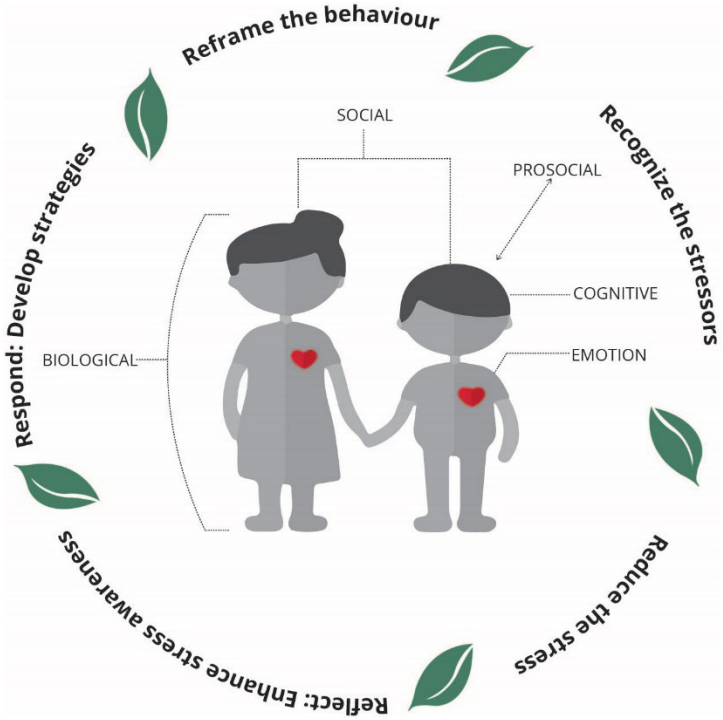
Five practices supported the application of Self-Reg theory. Originally described as the 5 steps of Self-Reg (also referred to now as practices) these steps scaffolded the enactment of the Self-Reg theory. Although presented numerically, these steps are not intended for linear implementation, rather, their application is determined by the needs and possibilities of each unique situation with consideration to the individuals involved. While the first three steps support immediate responses to dysregulation of self or others, a sense of safety and calm is a pre-requisite for fourth step (reflect) and can be supported through the fifth step promoting restoration of energy (respond) (Shanker & Hopkins, 2020). The 5 steps of Self-Reg (Shanker & Hopkins, 2020) include:

1. *Reframe* the behaviour
2. *Recognise* the stressors
3. *Reduce* the stress
4. *Reflect* to become stress aware
5. *Respond* through restoration

The 5 domains of stress and 5 steps of Self-Reg are depicted in Figure 4 (The MEHRIT Centre, 2021b), capturing the essence of the Self-Reg process.

Figure 4

The Shanker Method® Roundabout Graphic



From "*The Shanker Method® Roundabout Graphic*," The MEHRIT Centre, 2021 (https://self-reg.ca/wp-content/uploads/2021/05/Graphic_5_Steps_Roundabout.jpg)

My justification for selecting Self-Reg theory (Shanker, 2013; 2020) as the framework for the intervention for this research was grounded in its scientific foundations, its process - applicable to adults (and students) at any stage of life, and its potential for "enhancing [participants'] self-regulation by understanding stress and managing energy and tension" (Shanker & Hopkins, 2020, p. 1). Shanker acknowledged the complexity of self-regulation, suggesting it "should be viewed through the model of dynamic systems theory" (Shanker, 2013, p. 2). The implications of the developmental manifold (Gottlieb, 2002) and the contextual layers of family, classroom, school, community, and society (each embedded within a larger context, aligning it with Bronfenbrenner's ecological model) recognised by Shanker (2020), provided further justification for using Self-Reg theory (Shanker, 2013; 2020), as these were all relevant aspects within my research context.

Other theoretical contributions embedded within Self-Reg theory (Shanker, 2013; 2020) were used within the PL and research. These included the triune brain

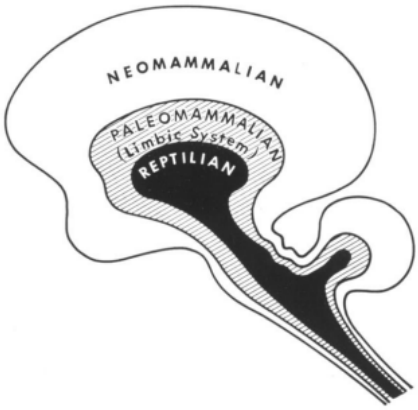
model (MacLean, 1990), the concept of energy and tension (Thayer, 1996), as well as the social engagement system and hierarchy of stress responses (Porges, 2001, 2011). Each of these are explained below.

The Triune Brain

Maclean's (1977) model of the triune brain provided an accessible metaphor of the brain's three evolutionary brain structures (see Figure 5) and the relationships among them.

Figure 5

MacLean's Triune Brain Model



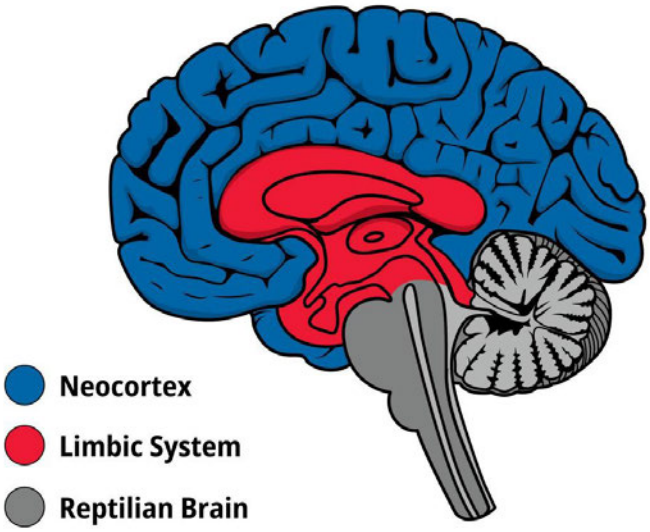
(MacLean, 1967)

Maclean (1967) claimed, "in its evolution, the human forebrain expands in hierarchic fashion along the lines of three basic patterns that may be characterized as reptilian, paleomammalian, and neomammalian" (p. 208). He described the radical difference in chemistry and structure of each structure as well as their evolutionary chronology. These three structures included: the ancient reptilian structure at the base of skull "which oversees core metabolic functions and basic survival mechanisms" (Shanker, 2020, p. 27); the central paleo-mammalian or limbic structure "which evolved to meet the needs of social species" (Shanker, p. 27); and, the most recent evolutionary structure, the neomammalian or neocortex "which subserves rational and linguistic functions" (Shanker, p. 27), including complex processes like language, problem solving, learning, and metacognition (MacLean, 1990). Each of these structures play a role in the stress response activating systems which enable or inhibit various capacities and functions (Shanker, 2020).

A colour-coded version of this model is used within Self-Reg material (Shanker & Hopkins, 2020), resulting in terminology such as “blue brain,” “red brain,” and “gray brain.” This terminology helps to explain the brain structures (e.g., red brain suggests the hippocampus, amygdala, hypothalamus…), stress responses (grey brain – sympathetic nervous system mechanisms and responses like fight/flight), behaviours and capacities (blue brain – learning behaviours and capacities to socially engage, problem solve, exercise self-control…) (see Figure 6).

Figure 6

The MEHRIT Centre’s Triune Brain Image



From “The *Triune Brain*,” The MEHRIT Centre, 2021 (https://self-reg.ca/wp-content/uploads/2020/08/Triune_Me_We.jpg)

Researchers noted criticism of the triune brain model for its inability to reflect the highly complex nature of the brain (Sapolsky, 2017; Shanker, 2020). Sapolsky summarised four of these criticisms as: how anatomical overlaps between the three structures were not clearly described; the model did not represent the flow of information and commands; it promoted the idea of evolutionary stacking without recognition of changes in older centres; and, critiques of how “automatic aspects of behavior (simplistically, the purview of layer 1), emotion (layer 2), and thought (layer 3) are not separable” (p. 23). While these criticisms suggested an oversimplification of complex brain mechanisms, the triune brain afforded educators with a “metaphor that

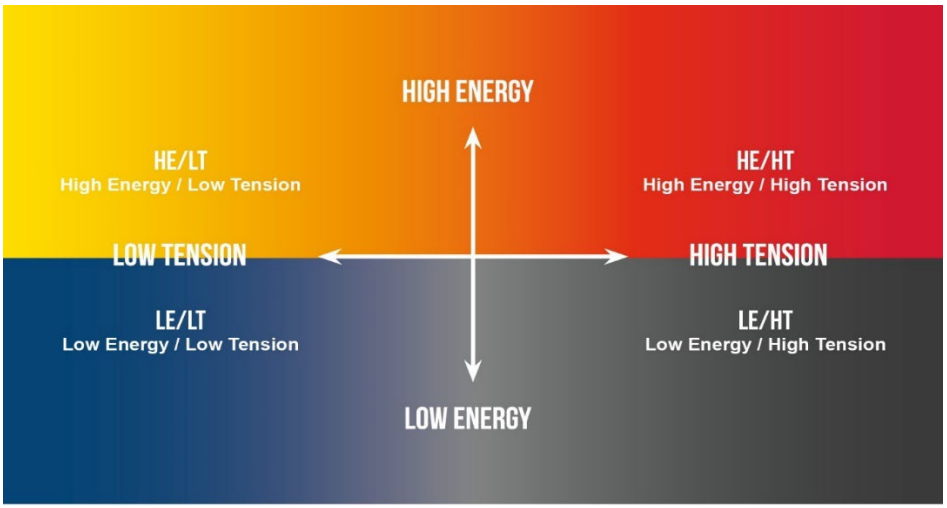
highlight[ed] the different processes of neocortical and subcortical functions and how these influence each other" (Shanker & Hopkins, 2020, p. 6).

Energy and Tension

The role of energy and tension was represented in the literature through Thayer's (1996; 2003) research on mood. He noted various body states and described them as calm-energy, calm-tiredness, tense-energy, and tense-tiredness (Thayer, 2003, pp. 11-12). He noted how these different states related to different moods and how some states were conducive to certain activities while others made people susceptible to dysregulation. Thayer's energy and tension states were adapted by the MEHRIT Centre (2020) and represented in Figure 7.

Figure 7

The MEHRIT Centre's Adapted Thayer Energy and Tension Matrix



From "The *Thayer Matrix*," The MEHRIT Centre, 2020 (https://self-reg.ca/wp-content/uploads/2020/06/Thayer_Matrix.jpg)

Each quadrant represented in this matrix suggested prime conditions for certain outcomes and activities. For example in low energy/low tension, parasympathetic processes were enhanced and restorative activities like "sleeping, resting, and chatting" were possible (Shanker & Hopkins, 2020, p. 10). High energy states provided optimal learning states, with various degrees of tension allowing social engagement, concentration, and physical and cognitive challenges to be attempted. The combination of low energy and high tension potentiated dysregulation, and sometimes drew stimulus seeking activities in "order to produce dopamine and

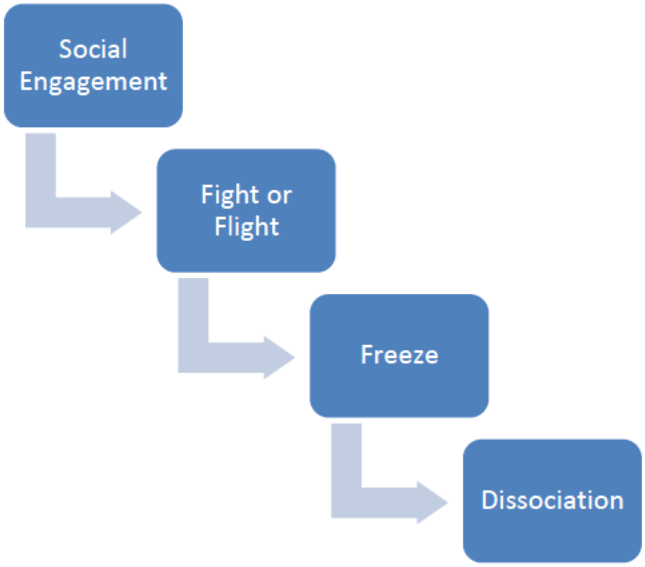
adrenaline" (Shanker & Hopkins, p. 10) to re-energise, resulting in continued energy depletion. In low energy/high tension, the stress response was evidenced by a person's voice (tone, pitch, and utterances), muscular tension, perceiving threat where there was none, and activity (for example: eating high calorie foods to fuel the threat response; aggression; reclusion; avoidance; immobilisation) (Porges, 2007; Porges, 2011; Sapolsky, 2017; Shanker, 2020; Thayer, 1996; 2003; van der Kolk, 2014).

Hierarchy of Stress Response

Porges' polyvagal and hierarchy of stress response theories (1995; 1997; 1998; 2001; 2007; 2011; 2017) further contributed to an understanding of the brain and body response to stress. The polyvagal theory (poly - because of the two vagus branches, ventral and dorsal) brought a deeper understanding to the structures, relationships, and sensory pathways within the autonomic nervous system, specifically the tenth cranial nerve (known as the vagus) and its role in connecting areas of the brainstem with certain organs in the body. Each branch of the vagus originated in a different area of the brainstem and terminated in organs either above (ventral) or below (dorsal) the diaphragm. The myelinated, ventral, vagus nerve connected from the brainstem to "the striated muscles of the face and head to produce an integrated social engagement system" (Porges, 2017, p. 5). This social engagement system "emerges from a heart-face connection and coordinates the heart with muscles in the face and head" (Porges, 2017, p. 27). Social engagement was also highlighted by Porges (2001, 2011) as the first stress response within a hierarchy of stress responses when the brain perceived threat. Figure 8 depicts Porges' hierarchy of stress responses, each of which become more energy-expensive to the body than the previous one.

Figure 8

Porges' Hierarchy of Stress Responses



This literature on stress and the body described the psychophysiological aspects of stress both essential to our growth and development as humans and underpinning many of the wellbeing challenges we face in the world we live in. It suggested that in order to thrive, we need to be able to successfully regulate the daily stressors that disrupt homeostasis through social engagement and awareness of energy and tension and subsequent growth-promoting recovery to restore (Gluschkoff et al., 2016; Shanker, 2020; Thayer, 1996; 2003). The significance of these understandings in stress-rich professions cannot be underestimated (Langan-Fox & Cooper, 2011).

Literature Review

The next two sections of this chapter review the literature claiming links between teacher wellbeing and student outcomes, exploring teacher stress, and describing effective teacher PL. The literature supported my identification of design principles for further testing and refinement across this research.

Linking Teacher Wellbeing and Student Outcomes

> The wellbeing of children is inseparable from the wellbeing of the critical adults in their lives. (The MEHRIT Centre, 2018)

An abundance of literature draws strong links between teacher wellbeing and positive student outcomes (Clunies-Ross et al., 2008; Jennings & Greenberg, 2009; Jennings et al., 2021; Prain et al., 2019; Schussler et al., 2016; Spilt et al., 2011; Swabey et al., 2019). For students, "the affective quality of the teacher-student relationship is an important factor in their school engagement, wellbeing, and academic success" (Spilt et al., 2011, p. 458); yet, it is also important to understand "that [teacher] wellbeing, in turn, most likely influences the ability to form personal relationships" (Spilt et al., 2011, p. 459). Jennings and Greenberg (2009) characterised socially and emotionally competent teachers as having high self and social-awareness, prosocial values, thought for others in their decision making, the ability to "manage their emotions and behavior, and… their relationships with others" (p. 495), and the capacity to draw on these characteristics when circumstances become challenging. These claims underscore the importance of teachers looking after their own wellbeing to ensure they are available to support their students (Rockel & Fryer, 2016).

Conversely, Jennings and Greenberg (2009) claimed, exhausted and "burned out teachers and the learning environments they create can have harmful effects on students, especially those who are at risk of mental health problems" (p. 492). Similar claims made by other researchers proposed the negative impacts of teacher stress on students (Bellingrath et al., 2008; Oberle & Schonert-Reichl, 2016; Ramberg et al., 2020). Derakshan and Eysenck (2009) also provided strong empirical evidence of the negative effects of anxiety on one's ability to process and perform while a study by Oberle and Schonert-Reichl (2016) concluded, "teachers' occupational stress is linked to students' physiological stress regulation" (p. 30) as measured by cortisol secretion. (For more details on the role of cortisol dysregulation in school teachers, see (Bellingrath et al., 2008)).Considering the additional stressors of working within challenging contexts (Simon & Moore Johnson, 2015), and the high needs and

entitlements of the students within them, how are teachers learning about stress and managing it so they can have the energy and tension balance needed to support their students through co-regulation?

Teacher Stress

> Excessive stress is education's greatest nemesis as students have to be calm to learn, teachers have to be calm to teach, and administrators have to be calm to lead. (Shanker & Hopkins, 2020, p. 184)

The literature provided historical evidence of teaching as a stressful profession (Gold & Roth, 2013; Kyriacou, 1987; Langan-Fox & Cooper, 2011; Spilt et al., 2011) with recent claims of increased stress (Education Support Partnership, 2018; Kim et al., 2022; Macintyre et al., 2020; Pressley, 2021) and "ever increasing demands" (Jennings & Greenberg, 2009, p. 496). In 1978, Kyriacou and Sutcliffe proposed a model of teacher stress that conceptualised "teacher stress as a response syndrome mediated by an appraisal of threat to the teacher's self-esteem or wellbeing and by coping mechanisms activated to reduce the perceived threat" (p. 5). Similarly, Prilleltensky et al. (2016) conceptualised teacher stress, inferring the perception of threat as they suggested teacher stress was "an imbalance between risk and protective factors" (p. 104).

Catalysts for teacher stress are well-documented in the literature and stressors varied greatly among individual teachers (Jennings & Greenberg, 2009; Kokkinos, 2007; Kyriacou, 1987). Kyriacou (2011) considered teacher stress in terms of:

> the level of pressure and demands placed on the teacher …, the teacher's emotional and behavioural responses to such demands … [and the] transaction (or degree of mismatch) between demands on the teacher on the one hand and the teacher's resources and capabilities to deal with these demands on the other (p. 161).

Some examples from the literature included teacher stress deriving from: collegial relationships (Kyriacou, 1987), emotional demands (Chang, 2009; Jennings & Greenberg, 2009; Kokkinos, 2007), work conditions (Kyriacou, 1987; Prilleltensky et al.,

2016; Simon & Moore Johnson, 2015), workload (Timperley & Robinson, 2000), student dysregulation (Kokkinos, 2007; Kyriacou, 1987; Prilleltensky et al., 2016), salary (Kyriacou, 1987), work status (Kokkinos, 2007; Kyriacou, 1987), and teacher organisational habits (Timperley & Robinson, 2000). The literature demonstrated that these kinds of stressors, experienced over prolonged periods, often resulted in teacher burnout (Devereux et al., 2009; Gluschkoff et al., 2016; Kokkinos, 2007; Kyriacou, 1987; Skaalvik & Skaalvik, 2017), affecting teachers' health, job satisfaction, and continuation in the profession (Education Support Partnership, 2018; Gold & Roth, 2013; Klassen & Chiu, 2010; Kyriacou, 2001).

Gluschkoff et al. (2016) highlighted the inability to recover and restore through relaxing leisure activities and restorative sleep as a factor contributing to burnout in teachers as they noted "stressed individuals, who are most in need of recovery, may find unwinding difficult" (p. 567). Shanker and Hopkins (2020) also noted that a person in a low energy/ high tension state may be "prone to resist anything that promotes rest and restoration" (p. 10). A person unable or struggling to restore cannot benefit from the affordances of the parasympathetic nervous system where digestion, immune responses, and growth promoting homeostasis can promote wellbeing (Sapolsky, 2004).

Challenging Contexts

Acknowledging that teaching is a stressful profession in general, recognises the daily challenges teachers face; however, not all teaching contexts are alike. For some teachers, the 'regular' stressors associated with the teaching profession can be significantly compounded by working in highly challenging contexts (Brunzell et al., 2018; Simon & Moore Johnson, 2015). Contextual factors including socioeconomics (Evans & Kim, 2013; Grzywacz et al., 2004; McCoy & Raver, 2014; Roy et al., 2014) and student trauma (Perry & Pollard, 1998; van der Kolk, 2005; Walkley & Cox, 2013) can contribute to an increase in teacher stress described by Selye (1956) as *distress*, at the same time as providing an experience of engagement in meaningful work (Brunzell et al., 2018) – *eustress* (Selye, 1956). Students affected by socioeconomic factors and/or trauma depend on their teachers to be "prosocial leaders" (Jennings et al., 2021, p. 79) to potentiate their growth and development and support positive trajectories

(Shanker & Hopkins, 2020). Yet, teachers experiencing burnout are more likely to have "inflate[d] perceptions of antisocial and oppositional behaviors" (Kokkinos et al., 2005, p. 87) leading to reactions that fuel student dysregulation, adding further stress for both teacher and student alike (Shanker & Hopkins, 2020).

Stress Management

Evidence of growth-promoting and maladaptive strategies applied by (or suggested for) teachers were provided in the literature (Shanker & Hopkins, 2020). Austin et al. (2005) concluded that exercise was a growth-promoting strategy to support stress management used by teachers in their study, whilst Tatar (2009) described stress management through teachers' social engagement with colleagues and counsellors. Maladaptive approaches described by Austin et al. (2005) included "escape avoidance and accepting responsibility" and "uncontrolled aggressive activities such as throwing objects" which "had negative implications as only teachers with high stress levels used them" (p. 78).

Various approaches and strategies to managing stress were reported in the literature (Harris et al., 2016; Harris, 2011; Nagel & Brown, 2003; Schussler et al., 2016); however, almost none included gaining a basic understanding of the brain/body response to stress. Evidence of teachers learning fundamental neuroscience to support their own stress management was found in emerging literature on self-regulation, in particular, literature using Self-Reg theory (Rosati, 2020; Shanker & Hopkins, 2020). In this literature, mechanisms and relationships within brain structures (MacLean, 1990), the role of energy and tension in determining capacity to manage stress well (Thayer, 1996; 2003), and various stress responses (Porges, 2001, 2011) provided the critical foundation for understanding stress and the body's stress response.

While Jennings and Greenberg (2009) suggested educational systems fall short of providing appropriate PL to preservice and in-service teachers to build their competencies for managing the diverse and varied stressors inherent to the profession, my research sought to address this through the intervention of Self-Reg PL to develop teachers' self-regulation to support stress management. This led me to engage with the literature on learning, and more specifically, teacher PL.

Teacher Professional Learning

> Teacher professional learning is a complex process, which requires cognitive and emotional involvement of teachers individually and collectively, the capacity and willingness to examine where each one stands in terms of convictions and beliefs and the perusal and enactment of appropriate alternatives for improvement and change. (Avalos, 2011, p. 10)

The teaching profession inherently involves teachers in both informal and formal learning as they go about their daily work and participate in organised learning opportunities (Lantz-Andersson et al., 2018). According to Cooper et al. (2020) teacher PL was about "working 'with' teachers as opposed to working 'on' teachers" (p. 2) with no singular approach meeting all teachers' PL needs (Guskey, 1994). The literature commonly described teacher learning as professional *development* (PD) or professional *learning* (Easton, 2008; Webster-Wright, 2009). Easton (2008) suggested the PD referred to a one-off events, appropriate in some cases and with questionable effectiveness in others (Clarke & Hollingsworth, 2002), while PL describes ongoing, iterative learning, "focusing on students, attending to requisite knowledge and skills, engaging is systematic inquiry into the effectiveness of practice, being explicit about underpinning theories of professionalism and engaging everyone in the system of learning" (Timperley, 2011, p. 4). Teacher PL required access to human, material, and financial resources not always easily accessible to schools, suggesting the benefits of partnerships with others to bring it to fruition (Swabey et al., 2021). Ultimately, teacher PL potentiated teacher change in behaviour, practice, attitude, and thinking (Avalos, 2011; Borko, 2004; Clarke & Hollingsworth; Darling-Hammond et al., 2017; Tripp & Rich, 2012).

To consider the various components of teacher PL, I begin by reviewing the literature on learning and learning theory. Then, I review the literature on stress and learning to further understand teacher engagement (or lack of engagement) in PL. Finally, I review the literature on what makes teacher PL effective.

Learning and Learning Theory

> Learning theory, "provides an explanation of how learning occurs as well as being suggestive as to how such an explanation translates into practice." (Merriam & Bierema, 2014, p. 25)

Merriam and Bierema (2014) illustrated the historical, global, and interdisciplinary quest to understand *learning*: what it is, and how it happens. Traditional understandings of learning focused on knowledge and skill acquisition, whereas contemporary conceptualisation of learning included "emotional, social and societal dimensions" (Illeris, 2009, p. 1). Merriam and Bierema (2014) described learning as both a process and an outcome, and shared that learning can "emphasize the cognitive as in gaining knowledge of something, psychomotor as in learning a new physical skill, or affective, having to do with emotions and attitudes" (p. 25). Illeris (2016) broadly defined learning as "any process that in living organisms leads to permanent capacity change and which is not solely due to biological maturation" (p. 3).

Learning theorists' continued exploration of the occurrence and application of learning provide many traditional, over-lapping, and new ideas and possibilities (Illeris, 2009). Illeris documented some contemporary theories of learning in his book on the subject, and although he suggested that he valued and was curious about modern brain research, he excluded contributions from this field in the book, providing the justification, "I think that they are still too specialised to have the status of general understandings of learning" (2009, p. 4). More recently, educational neuroscience has become "an interdisciplinary research field that seeks to translate research findings on neural mechanisms of learning to educational practice and policy and to understand the effects of education on the brain"(M. C. S. Thomas et al., 2019, p. 477), advocating for the inclusion of neuroscience to inform learning theory (Bellert & Graham, 2013; Ng, 2018).

For this research, initial learning theories employed in my work with participants included key concepts from Vygotsky, Bruner, and Bandura's social

constructivist learning theories as well as Lave and Wenger's (1991) situated learning theory that recognises the social and situated nature of teacher learning (Avalos, 2011; Borko, 2004; Clarke & Hollingsworth, 2002). As the research progressed, further exploration into Maslow's humanism and various stress theories (including Polyvagal theory and Self-Reg theory described earlier) continued to inform the occurrence and application of learning (or in some cases reduced capacity to learn). Piaget's language of *homeostasis* and *energy* (2003) used in his theory of learning equilibrium also resonated with language and concepts found within the stress literature.

The DBR methodology promoted engagement *with* and creation *of* theory (Anderson & Shattuck, 2012). Using the definition of learning theory by Merriam and Bierema (2014) at the beginning of this section, my first two research questions provided a foundation to further consider and create learning theory as I sought to establish *how* teachers developed self-regulation knowledge and skills and what *enabled* and *constrained* their application of this learning.

Stress and Learning

Learning is a stress (Shanker & Hopkins, 2020); it disrupts homeostasis (Ursin & Eriksen, 2004) and causes the body to burn energy to restore equilibrium (Piaget, 2003). Ideally, when someone is learning, hyperstasis - "a new, improved homeostatic capacity is attained" (Chrousos, 2009, p. 375), inferring growth-promoting outcomes. These positive outcomes, coming from the stress of learning, are enabled by neocortical and limbic balance (Shanker, 2020), appropriate levels of energy and tension (Thayer, 1996; 2003), and a state of perceived safety supported by the social engagement system (Porges, 2001, 2011) resulting in learning (in this scenario) being a positive, growth-promoting stress.

Learning can also be a source of negative stress, leading to a reduced capacity to learn and remember (Vogel et al., 2018; Vogel & Schwabe, 2016) or benefit from its growth-promoting attributes (Shanker, 2020). When the energy demands of learning are not available, tension is high, threat is detected, and the body activates a threat response, which dampens neocortical functions as the body primes for stress. Learning itself is not always the cause of this activation of the stress response.

Kwakman (2003) suggested personal factors, task factors, and work environment factors as possible sources affecting teachers' engagement in PL.

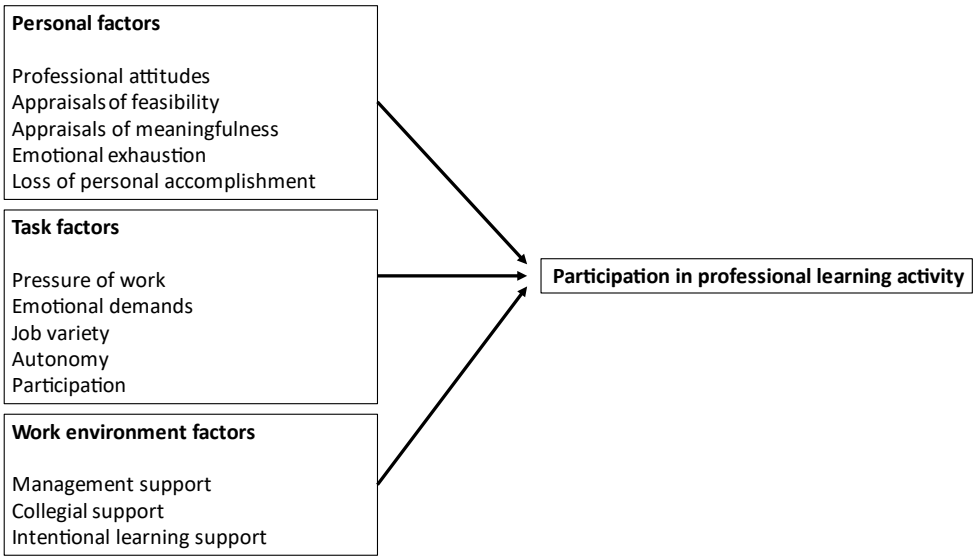
The literature associated learning with an unsettling feeling (Thompson et al., 2020) where the learner experienced discontinuity described as "boundary experiences" (Mesker et al., 2018, p. 54). These boundary experiences engaged the learner in "(re)positioning themselves" (Mesker et al., p. 54) and inferred a restoration of equilibrium (Piaget, 2003). Boundary experiences, unsettling feelings, and repositioning to restore equilibrium all evidence the stress of learning and the energy (and reduced tension) necessary to engage successfully in the learning process (Shanker, 2013).

Teacher Engagement in PL

Factors effecting engagement in PL were inferred from the teacher stress and burnout literature and specifically addressed in other literature (Clarke & Hollingsworth, 2002; Durksen et al., 2017; Kwakman, 2003). Kwakman (2003) offered three categories of factors that impacted teachers' participation in PL activity (see Figure 9).

Figure 9

Kwakman's (2003) Research Model of Professional Learning Activity



From "Factors Affecting Teachers' Participation in Professional Learning Activities," by K. Kwakman, 2003, *Teacher and Teacher Education, 19*(2), p.158 (https://doi.org/10.1016/S0742-051X(02)00101-4)

Kwakman's (2003) factors suggested potential positive and negative stressors affecting teacher participation in PL, while Durksen et al. (2017) suggested "challenges such as time, isolation, workload, and differing learning needs or subject areas" (p. 23) may decrease motivation to participate in PL. Clarke and Hollingsworth (2002) also claimed contextual factors that enabled and constrained PL for teachers citing four factors for consideration: Opportunities to access PL; "restriction or support for particular types of participation"; a climate conducive to experimentation; and, enduring administrative assistance (or lack of) in supporting the application of new ideas (p. 962).

Effective Teacher PL

While the importance of teacher PL is well established within the literature (Avalos, 2011; Darling-Hammond et al., 2017; Timperley, 2008), studies also noted that teacher PL is not always effective (Borko, 2004; Clarke & Hollingsworth, 2002; Opfer & Pedder, 2011). Claims within the literature suggest characteristics of *effective* teacher PL included learning that is:

- centred on student needs (Avalos, 2011; DuFour, 2004; Muijs et al., 2014; Timperley, 2008, 2011);
- inquiry based (Davey & Ham, 2010; DuFour, 2004; Muijs et al., 2014; Timperley, 2008, 2011);
- collaborative (Avalos, 2011; Cooper et al., 2020; Darling-Hammond et al., 2017; DuFour, 2004; Muijs et al., 2014; Timperley, 2008, 2011);
- of a sustained duration (Cooper et al., 2020; Darling-Hammond et al., 2017; Thompson et al., 2020),
- rich in feedback and opportunities to reflect (Cooper et al., 2020; Darling-Hammond et al., 2017; Thompson et al., 2020);
- content rich (Borko, 2004; Darling-Hammond et al., 2017; Easton, 2008; Timperley, 2008);
- contextually and personally relevant (Borko, 2004; Cooper et al., 2020; Davey & Ham, 2010; Kwakman, 2003; Thompson et al., 2020);
- supported by leadership and mentoring (Darling-Hammond et al., 2017; Davey & Ham, 2010; Timperley, 2008); and,

- applied (Easton, 2008; Timperley, 2008).

An additional characteristic of effective learning, suggested within the literature, was embodiment. Capturing this concept of embodiment, Stolz (2015) offered:

> What makes this account of embodied learning educationally significant is that the whole person is treated as a whole being, permitting the person to experience [themself] as a holistic and synthesised acting, feeling, thinking being-in-the-world, rather than as separate physical and mental qualities which bear no relation to each other (p. 474).

I drew from all these characteristics to begin shaping the initial DPs for the research (see Table 1), noting the exclusion of the first characteristic – centred on *student* needs – as this PL centred on *teacher* outcomes with students as vicarious beneficiaries of teachers' personal learning.

Table 1

Shaping DP Themes Informed by Effective Teacher PL Literature

DP1 Involving relationships	DP2 Involving relevant and accessible material	DP3 Involving application	DP4 Involving feedback
Collaborative	Inquiry-based	Applied	Mentoring
Supported by leadership and mentoring	Of a sustained duration		Rich in feedback and opportunities to reflect
	Content rich		
	Contextually and personally relevant		

Timperley (2008, 2011) suggested that for significant learning to happen, serious and challenging engagement from teachers in the PL process needed to occur. A central component to this process included rich dialogue to challenge beliefs, biases, and practices (Muijs et al., 2014), supported by professional relationships characterised by trust, challenge, and safety (Barth, 2006; Thompson et al., 2020).

I chose three sources to guide my four initial DPs. These included 10 principles of teacher PL and development (Timperley, 2008), seven design elements of effective professional development (Darling-Hammond et al., 2017), and specific to self-regulation, the MEHRIT Centre's eight guiding values (2018) (see Table 2).

Table 2

Key Literature Sources Shaping DPs

Timperley's (2008) principles of teacher PL and PD	Darling-Hammond et al.'s (2017) design elements of effective PD	TMC (2018) guiding values	Themes for DPs
1. Focused on valued student outcomes	1. Content focus	1. Shanker Self-Reg® is a universal platform	Involving *relationships*
2. Worthwhile content	2. Active learning	2. Shanker Self-Reg® is a process not a program	Involving *relevance and accessible material*
3. Integration of knowledge and skills	3. Collaboration	3. All people are capable of improving their self-regulation, no matter the age, stage, or ability level	Involving *application*
4. Assessment of professional inquiry	4. Use of models and modelling	4. Each individual, family, culture and community holds unique insights about self-regulation	Involving *feedback*
5. Multiple opportunities to learn and apply information	5. Coaching and expert support	5. There is no single set way to do Self-Reg	
6. Approaches responsive to learning processes	6. Feedback and reflection	6. There are no quick fixes, Self-Reg is a continual and reflexive process	
7. Opportunities to process new learning with others	7. Sustained duration	7. Self-Reg is for everyone, it's not just about children and youth	
8. Knowledgeable expertise		8. The wellbeing of children is inseparable from the wellbeing of the critical adults in their lives	
9. Active leadership			
10. Maintaining momentum			

Initial Literature-Informed Design Principles

> The knowledge claim of design-based research, and one that sets it apart from other research approaches, takes the form of **design principles**, that is, evidence-based heuristics that can inform future development and implementation decisions. (Herrington et al., 2007, p. 4095)

Timperley's 10 principles (2008), Darling-Hamond et al.'s seven design elements (2017), and TMC's eight guiding values (2018) underpinned the development of the DPs themed around relationships, relevant and accessible content, application, and feedback. While students were not the primary subject of the PL (as Timperley's first principle proposed), TMC's final guiding value "The wellbeing of children is inseparable from the wellbeing of the critical adults in their lives" (The MEHRIT Centre, 2018) foreshadowed how they would benefit. With DPs themes established, further investigation into the literature helped refine and justify them.

DP1: Establish and Maintain Effective Relationships

Development of DP1 drew from Timperley's (2008) fifth principle - "multiple opportunities to learn and apply information… in environments that offer both trust and challenge" (p. 15). She further outlined that trust was important due to the emotion associated with change. Darling-Hammond et al. (2017) underscored collaborative teacher communities (principle 3), and coaching and expert support (principle 5) as important to effective PL. The fourth guiding value for TMC stated, "Each individual, family, culture and community holds unique insights about self-regulation" (The MEHRIT Centre, 2018) inviting engagement with community to learn their unique experiences and needs. Together, these principles and values shaped DP1 which prioritised establishing and maintaining professional relationships as a key factor in effective self-regulation PL and the first principle I sought to evolve across the research.

Extending to the literature beyond these three key sources, DP1 was further informed. Effective PL was characterised by collaboration, mentorship, and leadership (Avalos, 2011; Cooper et al., 2020; Darling-Hammond et al., 2017; Davey & Ham, 2010; DuFour, 2004; Muijs et al., 2014; Timperley, 2008, 2011); – all suggesting that trusting professional relationships between people needed to be established and maintained (Thompson et al., 2020; Timperley, 2008). Coyle (2018) claimed, "group culture is one of the most powerful forces on the planet" (p. xvii), and described how this culture was underpinned by the building of safety, shared vulnerability, and the establishment of purpose (p. xix). Thompson et al. (2020) highlighted trusting professional relationships as fundamental to effective teacher PL and Timperley (2008) suggested that learning "must occur in environments characterised by both trust and challenge" (p. 15) due to the risk, emotion, and challenge to professional identity that change (promoted through PL) potentiated. Edwards-Groves et al. (2016) further specified elements of relational trust as interpersonal trust, interactional trust, intersubjective trust, intellectual trust, and pragmatic trust (p. 369) confirming that DP1's focus on relationships was well justified.

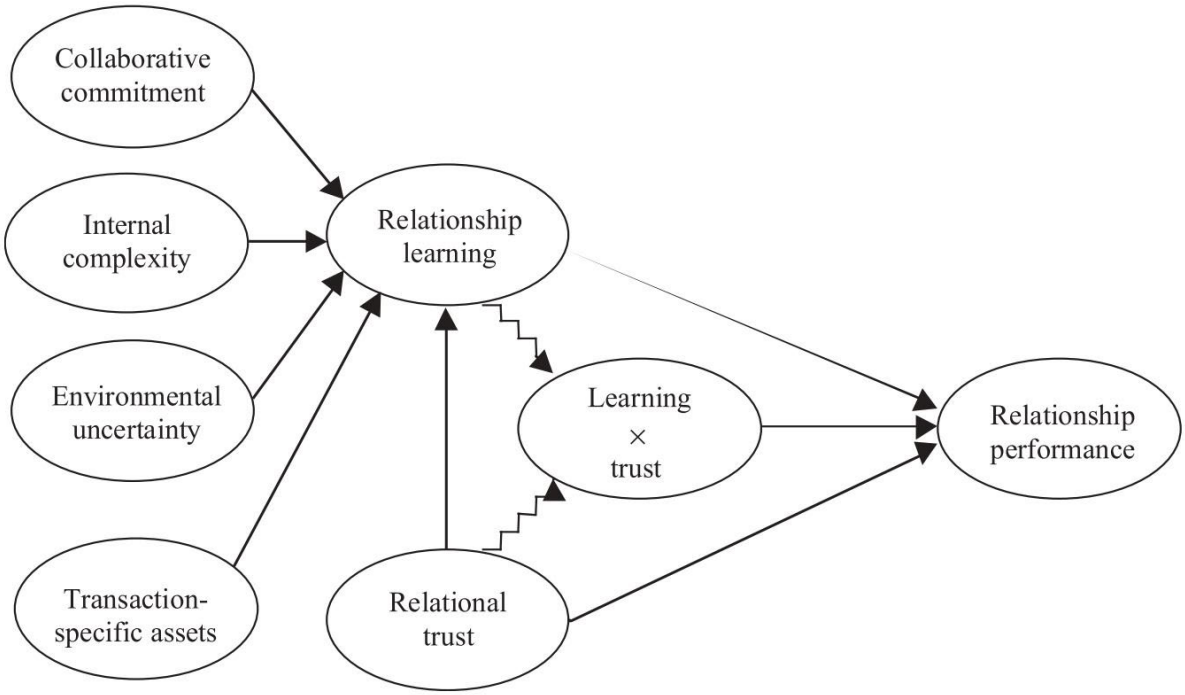
Wenger (2009) considered various relationships through the lens of social learning theory. He explained that social participation "as a process of learning and knowing"(p. 211) involved engaging with others in making sense of our world (meaning); taking action together with available resources (practice); understanding "social configurations in which our enterprises are defined as worth pursuing and our participation is recognizable as competence" (p. 211) (community); and identifying how our own learning journeys changes us within our contexts (identity) – the process of becoming (Adams et al., 2011; Dall'Alba, 2009).

As I engaged with the literature on relationships, I explored beyond the education literature to find valuable insights within the business literature. Selnes and Sallis (2003) created a theoretical model of relationship learning in customer-supplier relationships (see Figure 10) that "conceptualise[d] relationship learning as a joint activity in which the two parties strive to create more value together than they would create individually" (p. 81). Imagining the customer as the teacher, and the supplier as

the PL facilitator, this model supported many key ideas of relationships within teacher PL.

Figure 10

Selnes and Sallis' Theoretical (2003) Model of Relationship Learning



From "Promoting Relationship Learning," by F. Selnes and J. Sallis, 2003, *Journal of Marketing, 67*(3), p.81 (https://doi.org/10.1509/jmkg.67.3.80.18656)

In the Selnes and Sallis (2003) model, relational trust facilitated learning, fostering a collaborative commitment between the two parties. As this relationship evolved, it became more complex instigating further learning activities of mutual interest and benefit. Environmental uncertainty, regarding "forces in the environment over which the parties to the relationship have little or no control" (Selnes & Sallis, p. 81) also built relationship learning as parties applied available resources and actions in response. By adapting to each other, interdependence was fostered resulting in stronger capacities in relationship than as single entities. This model spoke to relational agency in PL and the "social construction of knowledge and meaning [that] are historically and culturally constructed through social processes and actions" (Young & Collin, 2004, p. 373).

Edwards (2007) described relational agency as "occupy[ing] a conceptual space between a focus on learning as enhancing individual understanding and a focus on learning as systemic change and includes both" (p. 5). A sociological lens was provided by Burkitt (2016) who added, "agency emerges from our emotional relatedness to others as social relations unfold across time and space" (p. 322). In considering Selne and Sallis's theoretical model of relationship learning (2003), Edwards' connection of relational agency to PL demonstrated distinct parallels. Edwards noted:

> Professional learning needs to include a capacity for interpreting and approaching problems, for contesting interpretations, for reading the environment, for drawing on the resources there, for being a resource for others, for focusing on the core objects of the professions, whether it is children's learning or social inclusion (p. 14).

This literature was fundamental in guiding the creation and evolution of the DPs in my research. I began with the two main types of relationships described by Thompson et al. (2020) and Borko (2004) as relationships between people (teachers with teachers, and teachers with PL facilitator); and over the course of the research extended the concept of relationships beyond people. DP1: *Establish and maintain relationships* became the first of four principles for evolution within the research.

DP2: Ensure Relevant and Effective Dissemination of Knowledge and Skills

Development of DP2 began by considering the second TMC value describing Self-Reg as a process not a program inferring the need for specific self-regulation knowledge and skills to be practically enacted. Timperley (2008) included (principle 2) "worthwhile content" (p. 10) and (principle 3) "integration of knowledge and skills" (p. 11). She also listed (principle 6) "approaches responsive to learning processes" (p. 17) as well as (principle 10) the importance of "maintaining momentum" (p. 24). The first, second, and fourth principles from Darling-Hammond et al. (2017) also considered content, active learning, and the use of models or modelling. This need for and focus on knowledge and skill development as well as the TMC value in the previous paragraph describing the unique self-regulation insights held by individuals and

groups, led me to create DP2: *Ensure relevant and effective dissemination of knowledge and skills*.

The broader literature on effective teacher PL suggested the learning should be inquiry-based (Davey & Ham, 2010; DuFour, 2004; Muijs et al., 2014; Timperley, 2008, 2011), content rich (Borko, 2004; Darling-Hammond et al., 2017; Easton, 2008; Timperley, 2008), contextually and personally relevant (Borko, 2004; Cooper et al., 2020; Davey & Ham, 2010; Kwakman, 2003; Thompson et al., 2020), and sustained in duration (Cooper et al., 2020; Darling-Hammond et al., 2017; Thompson et al., 2020). Teacher inquiry guided the PL ensuring it was relevant and the learning was offered in various modes to meet participant needs.

DuFour (2004) described the rich learning afforded by ongoing cycles of inquiry. According to Timperley (2008), the core question of inquiry-based teacher PL is, "What do we as teachers need to learn to promote the learning of our students" (p. 13)? Davey and Ham (2010) proposed this inquiry was both self-inquiry and "research that resolves practitioners' own questions and dilemmas about their practice" (p. 241).

Effective PL was recommended to be content rich, supporting teachers in learning curriculum, strategies, and pedagogies (Darling-Hammond et al., 2017). Borko (2004) also suggested PL content that deepened teachers' knowledge of subjects, strategies to guide students in their thinking, and instructional strategies. Thompson et al. (2020) suggested "credible and relevant content, mindful of and responsive to learning needs of individual teachers" (p. 99).

The relevance of PL, both contextually and personally (Kennedy, 2016), underpinned the 'why' behind teacher learning (Sinek, 2009) and called for "worthy, relevant and accessible" subject matter (Thompson et al., 2020, p. 88). Contextual and personal relevance provided a foundation for meaning-making (Davey & Ham, 2010), "involving both meaning-giving and sense-making" (Geijsel & Meijers, 2005, p. 419) - a catalyst for educational change and identity learning. Timperley (2008) differentiated between fixed programmes and context-specific approaches recommending, "context-specific approaches promote teaching practices that are consistent with the principles of effective teaching but also systematically assist teachers to translate those

principles into locally adapted application" (p. 10). The longitudinal nature of effective PL was also supported within the literature advocating that effective dissemination of knowledge and skills was supported through PL over a sustained duration (Thompson et al., 2020). This confirmed and justified DP2: *Ensure relevant and effective dissemination of knowledge and skills*.

DP3: Apply New Learning Often and Across Contexts

Timperley's fifth principle: "multiple opportunities to learn and apply information" (2008, p. 15) and Darling-Hammond et al.'s recommendation for PL over a "sustained duration" (2017, p. 15), was consistent with TMC value six: "There are no quick fixes, Self-Reg is a continual and reflexive process" (The MEHRIT Centre, 2018). This shaped DP3: *Apply new learning often and across contexts*. Timperley purported the iterative nature of learning and advised that "teachers needed to be able to revisit partially understood ideas as they try them out in their everyday contexts" (p. 15). Clayton (2007) described this application of learning as "practical risk taking" (p. 13), while Schuck et al. (2008) also listed risk-taking in the process of engaging with others to enhance PL.

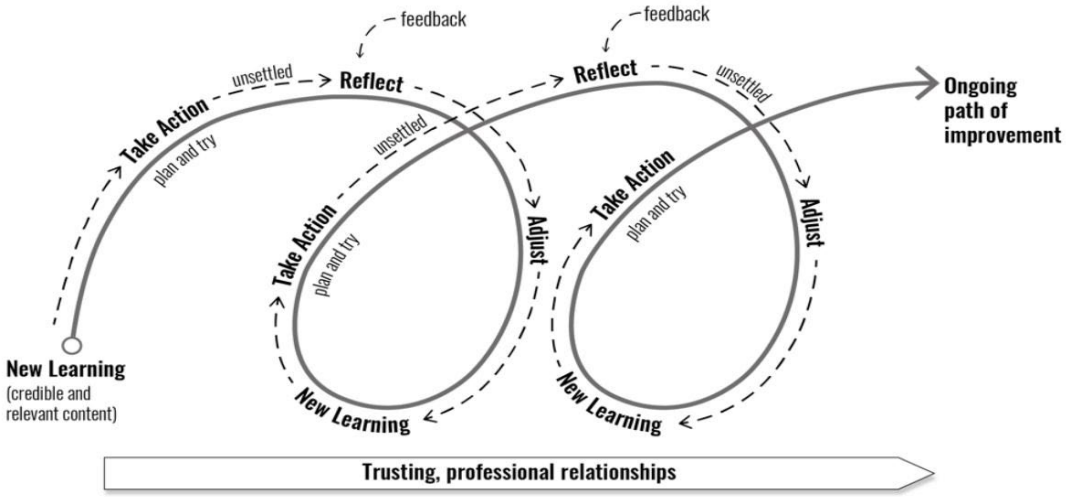
Engagement in teacher PL did not guarantee application of the learning (Prenger et al., 2019). Clarke and Hollingsworth (2002) claimed that the enactment of PL, interspersed with opportunities for reflection, promoted change in teacher practice, beliefs and attitudes, and student learning outcomes. By providing teachers opportunities to reflect on their practice (Thompson et al., 2020), which occurred in this study through the mode of learning conversations based on personal videoed examples of the participant teaching, Self-Reg theory was applied to practice.

Prenger et al. (2019) created a conceptual model for teacher PL that highlighted "application of knowledge and skills to change instruction" (p. 443) as one of four key stages. They based their model on one by Desimone et al. (2013) who inferred application in their four stage model, with the third stage noted as "change in instruction" (p. 63). Neither Prenger et al.'s or Desimone et al.'s models described iterative or longitudinal application. Thompson et al.'s (2020) model did and also inferred the stress associated with learning (see Figure 11). Their iterative model of PL proposed regular and ongoing opportunities to "take action; plan and try" (p. 98) and

also included the “unsettled” phase inherent to taking “practical risk” (Clayton, 2007, p. 13) through application.

Figure 11

Thompson et al.’s (2020) Iterative Model of PL



From “Elaborating a Model for Teacher Professional Learning to Sustain Improvement in Teaching Practice,” by P. Thompson, J Kriewaldt, and C. Redman 2020, *The Australian Journal of Teacher Education, 45*(2), p.98 (http://dx.doi.org/10.14221/ajte.2020v45n2.5)

Application of Self-Reg theory to practice occurred in this research through video learning conversations. Earl and Timperley (2009) proposed that qualities of evidence-based conversations included: “relationships of respect and challenge” aligning with DP1; “using relevant data” and an “inquiry habit of mind” – aligning with DP2; and, “engaging in learning conversations” (p. 3) to apply the learning –DP3. Learning conversations provided vehicles to make meaning of and interpret relevant data (Earl & Timperley, 2009). In this research, VLCs were one formal mode of application of theoretical knowledge providing a mode for DP3: *Apply learning often and across contexts.*

DP4: Engage in Feedback With Others

In creating DP4: *Engage in feedback with others*, Timperley’s (2008) fourth, seventh, and eighth principles: “Assessment for professional inquiry” (p. 13), “opportunities to process new learning with others” (p. 19) and “knowledgeable expertise” (p. 20) were relevant. Feedback was also highlighted by Darling-Hammond

et al.'s (2017) in their sixth element, "feedback and reflection" (p. 14) and TMC's third guiding value which suggested: "All people are capable of improving their self-regulation, no matter the age, stage or ability level". Feedback was also referenced by Porges through "neuroception" (Porges, 2017, p. 19) and "interoception" (Porges, p. 15) as well as feedback from other people.

Feedback was noted in the literature as an important aspect of teacher PL (Cooper et al., 2020; Darling-Hammond et al., 2017; Thompson et al., 2020) and conceptualised by Hattie and Timperley (2007) as "information provided by an agent regarding aspects of one's performance or understanding" (p. 81). Yet, feedback and reflection were referenced as "unsettling" in Thompon et al.'s iterative model of PL (2020, p. 98), with Davey and Ham (2010) concurring, "professional learning through (self-)critical reflection is not achieved rapidly, it is not achieved comfortably and it is not achieved alone" (p. 231). The potential for feedback to be perceived as threatening, a negative stress, was highlighted in these claims.

Hattie and Timperley (2007) suggested that feedback was "one of the most powerful influences on learning and achievement" (p. 81) and also alerted to the potential positive or negative impacts of feedback. While Hattie and Timperley (2007) provided details of positive impacts of feedback and eluded to how feedback may also be perceived as threatening, they did not discuss the effects of the perceived threat on the recipient of the feedback, for example, the recipient's energy and tension state (Thayer, 1996; 2003) or the neocortical dampening from the brain/body stress response triggered by the threat (Porges, 2011; Shanker & Hopkins, 2020). For feedback to be accessible and effective, safety needed to be perceived by the recipient (Dykema, 2006), making trusting and safe relationships a fundamental component of effective feedback for participants learning and applying self-regulation knowledge and skills. Engagement with this literature confirmed that DP4: *Engage in feedback with others* was appropriate and justified and video and VLCs were a key source of this feedback.

Video Use in Teacher PL

Literature on the use of video as a tool to enhance teacher PL provided evidence of the scope and effectiveness of this practice in providing feedback

(Fedders, 2011; Hollingsworth, 2005; Major & Watson, 2018; Marsh & Mitchell, 2014; Tripp & Rich, 2012; Zhang et al., 2011). Claims affirmed that learning occurred when teachers analysed their own or colleagues' practice via video (Hollingsworth, 2005; Sherin & Han, 2004; Zhang et al., 2011) with video providing both mirrors and windows into practice (Berting, 2003). Marsh and Mitchell (2014) reported asynchronous video-based learning (where learning happened through viewing *after* the filming is complete) predominated, with viewing and discussing a colleague's practice *while* videoing was taken, occurring less frequently. The literature reported affordances of video-based learning providing various opportunities for feedback such as mentorship (Davey & Ham, 2010), peer discussion (Kleinknecht & Schneider, 2013), facilitated group discussions (Coles, 2013), and video clubs (Sherin & Han, 2004).

Promising evidence suggested PL supported by video was effective (Borko et al., 2008; Marsh & Mitchell, 2014; Zhang et al., 2011). The capacity to capture the complexity of dynamic contexts; provide rich stimuli for discussion and reflection; and, review and analyse data multiple times from different perspectives, were well documented and attractive features for those who sought to enrich PL opportunities (Hollingsworth, 2005; Marsh & Mitchell, 2014). Given these reported affordances, a recurring question was, why do teachers avoid being videoed to support their PL (Dickerson et al., 2007; Ng, 2015; Zhang et al., 2011) and what can be done to increase teacher willingness in using video as a powerful professional tool?

Teacher aversion to being videoed was highlighted in the literature. Some teachers reported heightened anxiety at the prospect of being videoed reporting feeling self-conscious about appearance and/or voice, or threats to professional self-esteem (Dickerson et al., 2007; Zhang et al., 2011). While individual differences of the experience and effects of anxiety were noted (Eysenck & Derakshan, 2011), examples of teachers' concerns included the time-consuming nature of the process, including collecting permissions and equipment and potential technical complications as well as the disruption that videoing caused to students as deterrents for engaging with video as a professional learning option (Dickerson et al., 2007; Zhang et al., 2011). It was promising to note that teachers who were videoed, despite initially feeling anxious,

reported a reduction in anxiety as they acclimatised to the experience (Ng, 2015; Zhang et al., 2011).

Despite evidence of video as an effective tool in supporting PL, research suggesting *how* to increase teacher willingness to be videoed was difficult to locate. Dickerson et al. (2007) gave suggestions for actions to reduce elements believed to discourage teachers from opting to be videoed. These included: sourcing and setting up equipment; defining the audience (viewing by teachers and others of their choosing); determining the focus for viewing; viewing for PL rather than evaluation; finding ways to minimise the intrusive nature of video; and, highlighting positive examples rather than negative (p. 380). The Video Intervention for Positive Parenting model (Juffer, 1993), described in further detail in the Chapter 3, supported these recommendations by Dickerson et al. (2007).

The use of video for teacher PL feedback purposes benefited from an effective, protected, and accessible storage and retrieval platform. Acknowledged by other researchers as a platform capable of capturing and evaluating the complexities of teaching and learning (Hougan et al., 2018; Schroeder & Currin, 2019; J. Thomas et al., 2019), TORSH Talent enabled video footage to be uploaded, annotated by members of the research team, synchronous and asynchronous viewing and annotation, and the capacity to share videos between members.

Opportunities to Further Inform the Literature

My review of the literature highlighted some gaps as well as areas that stood to benefit from further exploration. There was a lack of research investigating effective PL for teachers about the brain/ body response to stress and processes for managing their own stress through self-regulation. How were teachers learning the mechanisms and relationships within the brain that enabled and constrained effective teaching and learning? The literature was abundant with research prioritising improved *student* wellbeing and academic outcomes through teacher PL; yet, less evident was research prioritising improved *teacher* wellbeing and professional outcomes through PL opportunities. The literature also stood to benefit from further investigation into how the allostatic overload experienced by teachers working within

highly challenging contexts enabled and constrained their own capacity to engage in and benefit from effective PL.

Chapter 2 Summary

I began this chapter by contextualising the key topics underpinning this research: stress, self-regulation, and Self-Reg. I then reviewed the literature on teacher wellbeing and student outcomes, teacher stress, and effective teacher PL. I built upon this as I reviewed further literature guiding and justifying the initial DPs for this research. To conclude the chapter, I highlighted how this research offers further insights to address gaps within the literature.

The following chapter describes the research methodology. In Chapter 3, I justify and explain my application of the DBR methodology underpinning this investigation and provide an overview the research approach, research design, data collection, and data analysis.

Chapter 3: Methodology

In Chapters 1 and 2, I introduced my research and provided a review of the key literature informing my investigation. In this chapter, I describe and justify my research methodology. The chapter is organised into the following sections:

- Research approach;
- Research design;
- Data collection;
- Data analysis; and,
- Chapter summary.

Research Approach

Research underpins the expansion of knowledge, improvement of practice, and the ability to engage in informed debates (Creswell, 2008). The field of educational research is challenged by the complex "ecology" (Cobb et al., 2003, p. 9) of the educational setting. Innumerable variables permeate contexts, participants, and the relationships; consequentially, educational research has "witnessed a proliferation of paradigms over time" (Cohen et al., 2011, p. 1). To this end, Crotty (1998) advocated that devising "a research process that serves our purpose best, one that helps us more than any other to answer our research question" (p. 216) was essential. Researcher assumptions also shape research. These paradigms or worldviews have implications for research practice (Creswell & Plano Clark, 2017).

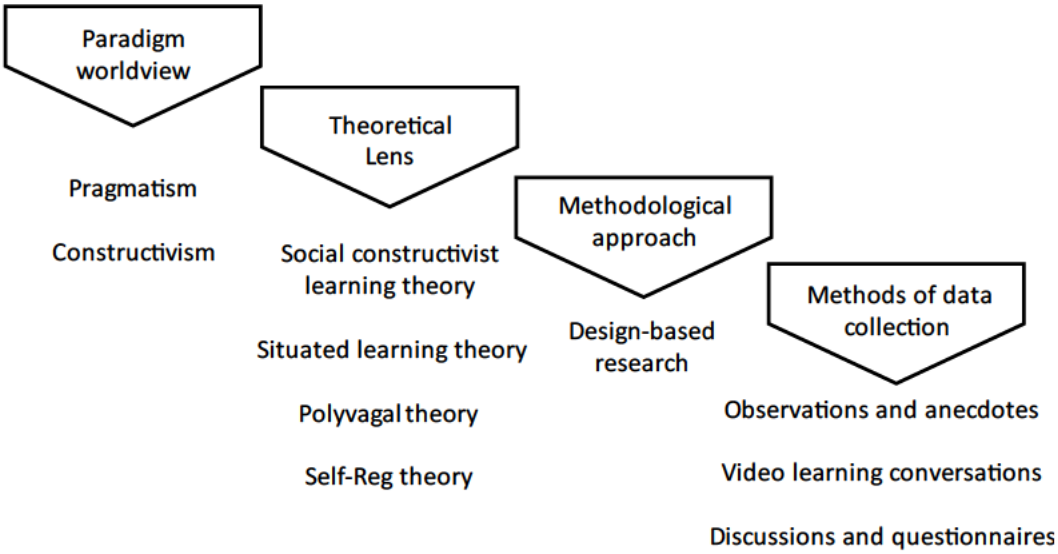
Two worldviews underpinned my research: pragmatism and constructivism. Predominant within my research was the pragmatist worldview, as it prioritised the real-world problems under investigation and used a pluralistic mixed methods approach to inform these problems (Tashakkori & Teddlie, 2021). Ontologically, multiple realities and perspectives were valued, and epistemologically, I "collect[ed] data by 'what work[ed]' to address [the] research question" (Creswell & Plano Clark, 2017, p. 38). The pragmatic worldview, as outlined by Creswell and Plano Clark, employed a reflexive methodology that combined qualitative and quantitative data and invited both formal and informal rhetoric.

The constructivist worldview was also represented within my research through the social construction of meaning and generation of theory. The ontology of constructivism, consistent with my interpretation of pragmatism, acknowledged multiple realities and perspectives yet inferred a closer and more subjective relationship between participants and researchers (Creswell & Plano Clark, 2017, p. 38). Early researcher-participant engagement provided the catalyst for future pattern recognition, theory building, and interpretation, and I embedded myself within the research context with participants to collect data (Creswell & Plano Clark, 2017). There was also a focus on the co-construction of practical professional knowledge about problems of practice with participants. Within the constructivist worldview, my biases and interpretations as researcher were recognised, requiring active reflexivity.

To share my philosophical approach to this research, I used the four-level frame, originally provided by Crotty (1998) and subsequently adapted by Creswell and Plano Clark (2017) (see Figure 12).

Figure 12

My Philosophical Approach to This Research



The worldviews of pragmatism and constructivism informed the four theoretical lenses for this research. These theoretical lenses included social constructivist learning theory (Vygotsky, 1978), situated learning theory (Lave &

Wenger, 1991), polyvagal theory (Porges, 1995, 1997, 1998), and Self-Reg theory (Shanker, 2013; 2020). The first two theories guided my approach to facilitating participants' professional learning within this research ensuring cultural, contextual, historical, socially situated, and legitimate peripheral participation constructs underpinned my practice. Self-Reg theory (including aspects of polyvagal theory) framed the content of the PL intervention in each iteration. In the third iteration of the research, I also used both polyvagal theory and Self-Reg theory as a lens to further understand what potentially enabled or constrained participants' engagement in the PL intervention.

Social constructivist learning theory is a "development and subset of constructivist learning theory" (Pritchard & Woolard, 2010, p. 4) that highlights "the importance of culture and environment in the manner in which [people] make sense of the world they experience, through social interaction" (Aubrey & Riley, 2019, p. 67). Embedded within social constructivist theory, is the concept of learning alongside more knowledgeable others (Vygotsky, 1978) within "the same cultural and social environment" (Aubrey & Riley, p. 60) and the ways this promotes development.

Also underpinning my research was the theoretical perspective of situated learning theory (Lave & Wenger, 1991), highlighting "the relationship between learning and the social situations in which it occurs" (p. 14). This "situated and social pursuit of knowledge and skill" (Aubrey & Riley, 2019, p. 212), referred to by Lave and Wenger as "legitimate peripheral participation" (p. 29), is underpinned by relationships between "newcomers and old-timers" (p. 29), potentiating formal and informal communities of practice. Similar to Vygotsky's (1978) concept of learning alongside more knowledgeable others, Lave and Wenger also acknowledged more experienced practitioners and their role within learning communities. These key principles from social constructivist and situated learning theories were applied to address the social and contextual dynamics of learning within my research, whereas polyvagal theory (Porges, 1995, 1997, 1998) and Self-Reg theory (Shanker, 2013; 2020) gave a greater understanding of the psychophysiology of the learner, informing what enabled and constrained participants in engaging in and applying PL.

Polyvagal theory (Porges, 2001) "emphasizes the phylogenetic origins of brain structures that regulate social and adaptive survival-oriented defensive behaviours" (section 6). This theory links the evolution of the autonomic nervous system to many of the body's responses and various "social, emotional, and communication behaviour… [and] stress-related responses" (Porges, Section 6). Self-Reg theory (Shanker, 2013; 2020) draws from Porges's polyvagal theory, Thayer's theory of energy and tension (1996; 2003), and MacLean's triune brain model (MacLean, 1990) among other theories, to consider energy and tension and detect these stress-related responses - often misunderstood as misbehaviour or behaviour that can be controlled. Self-Reg theory (Shanker, 2013; 2020) suggests a process for understanding and managing stress using 5 steps: reframe stress-related responses as such (stress-related not misbehaviour); recognise underlying stressors by considering 5 domains of stress; reduce stress across one or more of these domains; engage in reflection to create stress awareness; and, respond through energy restoration (Shanker, 2013; 2020). Together, these four theoretical lenses combined to inform the methodological approach for this investigation.

Researcher Reflexivity

The worldviews described in the previous section as well as my personal and professional history shared in Chapter 1 all contributed to the "broader debate about ontological, epistemological and axiological components of the self, intersubjectivity and the colonization of knowledge" (Berger, 2015, p. 220). They suggested potential influences on my research and the need for reflexivity across all components of my research. Berger suggested four considerations that I used to guide my reflexive process:

- "self-knowledge and sensitivity";
- an understanding of "the role of self in the creation of knowledge";
- ongoing monitoring of the "impact of [my] biases, beliefs, and personal experiences"; and,
- "maintain[ing] a balance between the personal and the universal" (p. 220).

My familiarity with challenging school contexts and my rich history in various roles gave me what Padgett (2016) described as an insider perspective. This enabled

me to connect with participants and their personal accounts. It also required a reflexive praxis to ensure that participants lead the creation of knowledge, that I in turn curated. By maintaining attention on *their* stories and experiences, validating and acknowledging *their* histories with other self-regulation learning (as each individual had a different path), and supporting *their* connection of Self-Reg theory to personal practice, my role in the creation of knowledge came through in the analysis and synthesis of this data and the subsequent contribution to theory and evolution of design principles.

Participants each brought their own biases, beliefs, and personal experiences to the learning and I was cognizant of how this added to the complexity and the richness of the research and learning journey. I noted my own fidelity to the Self-Reg process and the dissonance I felt when a participant shared their fidelity with an alternate perspective. It prompted me to stay open and engaged and to be a listener seeking to better understand participants' experiences without my own beliefs and values clouding their stories.

Ethical Considerations

Alongside my own reflexivity as researcher were the ethical considerations for this investigation. My research, embedded in this school setting, involved a variety of people both directly and indirectly and I ensured compliance with the National Health and Medical Research Council's (NHMRC) (2016) National Statement on Ethical Conduct in Human Research. This study received full ethical approval through the University of Tasmania's Human Research Ethics Committee (application H0015448) (see Appendix A).

All adult participants in my research were provided with project information (see Appendix B) and completed a consent form (see Appendix C). Video participants received video project information (see Appendix D) and completed a video consent form (Appendix E). I also provided parents and students with project information (see Appendix F) and a withdrawal of consent form (see Appendix G) alongside the school's standard consent procedures to ensure an additional layer of permission was secured to allow families to opt out of having their child appear on video.

Context

This research was "situated in a real educational context" (Anderson & Shattuck, 2012, p. 16) and while the statistical and demographic information provided in the introductory chapter about this Kindergarten to grade 6 primary school, its 299 students, and 51 teaching and non-teaching staff, this information alone did not share a sense of what it was like to be there in person. The following excerpts from my journal offer my initial thoughts and experiences from visiting this school in preparation for this research and provide important insight to support an understanding of the unique and highly challenging research context.

> *Prior to stepping foot on the school grounds, I had heard the school mentioned by others in the local community and across the state. The discourse was predominantly negative and alarming, presented in ominous and confronting terms. The school's location had been described to me as being in a "rough neighbourhood" and very "barren" due to a history of vandalism. One teacher shared that she had "never taught at a more challenging school" whilst another said she didn't know of anyone making it through the first week personalisedwithout crying by the time they made it to the end of the school driveway." These perspectives were not new to me as I had taught in schools sharing many similarities, often with the same social discourse permeating through the community. Deficit discourse and its power to stifle positive growth promotion was clearly evident.*
>
> *On my initial visits, I noticed evidence of the potential stress this community was under. Yes, the outside area was barren, it included some basic school yard play infrastructure and large expanses of concrete and grass. As I entered the building there was a sign on the front desk discouraging physical and verbal abuse towards the office staff. With a friendly welcome from them, I was entrusted with the necessary codes to enter locked doors within the building as well as warnings that students were not to know the numbers under any circumstances. The inside of the building was being painted and there were a variety of mazes and stations taped to some parts of the hallway floors.*

As the visits progressed, I began meeting students and teachers, hearing the diverse conversations between teachers, volunteers, teacher assistants, office staff and senior staff. The language used when discussing challenging students spanned across a continuum with terms like "bad", "rotten", "naughty", "feral" on one end, to "stressed", "threatened", "exhausted", "traumatised" on the other. These terms generally predicted the approach of the adult when challenged by student behaviour.

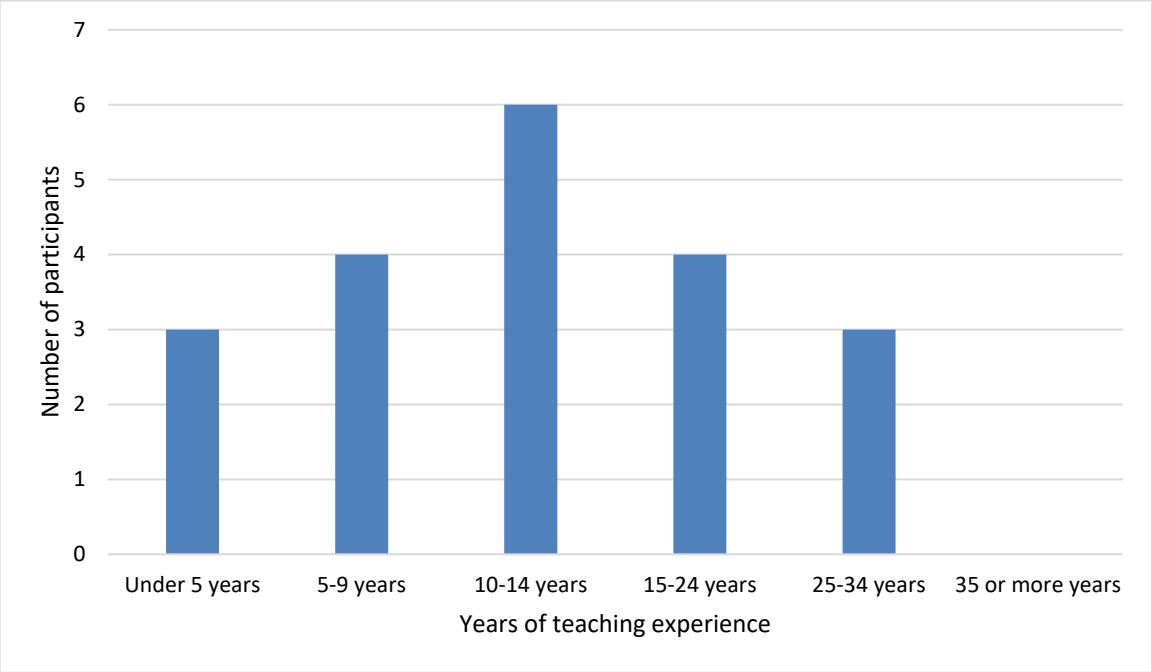
On my first visit, I experienced a lockdown (there were many that occurred over the times I attended), as a 10-year-old student was kicking in glass doors, screaming swear words, and threatening to harm people. An announcement over the loudspeaker initiated a schoolwide response. Classroom curtains were pulled, doors closed and locked, and within these dim secured spaces, teaching and learning programs continued until the announcement was made that all was safe again. I stayed locked in the staffroom during this time hearing fragments of the attempts of senior staff to deal with the situation and the intense rage of the student. It was confronting, and I was soon to realise, a regular part of the school week.

Participants

The 30 potential participants for this research included the teaching staff and leadership team employed within this highly challenging context. Many competing priorities comprised the busy and difficult nature of their work. Priorities were triaged by participants, some worked part-time, and absences occurred (due to ill health, leaves, other PL commitments, etc…). This resulted in the engagement of 20 participants in some (or all) of the three iterations. Their years of teaching experience varied (see Figure 13).

Figure 13

Participants' Years of Teaching Experience



Over the three iterations in 2019, some of the participants' roles within the school changed. Overall, most participants were full-time or part-time classroom teachers in composite grade classes. A small group of participants had mixed roles that included teaching specialist subjects like Fine Arts or Physical Education for all grades, teaching in the Green Room (an alternate space for students experiencing frequent dysregulation in their regular classroom to learn), or being part of the school leadership team, which meant taking on diverse roles across the school.

These 20 participants engaged in Self-Reg PL sessions and group discussions and completed anonymised questionnaires when they were present on the days that these sessions were conducted. This resulted in inconsistencies in the participant group over the course of the research. There was also an option to be videoed while teaching followed by a video learning conversation (VLC) to connect PL to practice, which some participants took up. Table 3 shows participant engagement (pseudonyms used throughout) with the different research elements.

Table 3

Participant Engagement With Research Elements

Participants	2018 PL	2018 Questionnaire	Iteration 1 PL	Iteration 1 video	Iteration 1 VLC	Iteration 1 Questionnaire	Iteration 2 PL	Iteration 2 video	Iteration 2 VLC	Iteration 2 Questionnaire	Iteration 3 PL	Iteration 3 video	Iteration 3 VLC	Iteration 3 Questionnaire
Isabel	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Juan	✓	✓				✓				✓				✓
Lesley	✓	✓	✓			✓	✓			✓	✓			✓
Kevin			✓			✓	✓			✓				
Mike	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Chris						✓				✓				
Alice						✓								✓
Belinda			✓			✓	✓			✓	✓			✓
Arlene			✓			✓	✓			✓	✓			✓
Lynda	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Christine	✓	✓	✓			✓	✓	✓		✓	✓		✓	✓
Joan	✓	✓	✓			✓								✓
Narelle	✓	✓								✓				✓
Larissa	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stewart	✓	✓								✓				
Fatima										✓				
Harriet	✓	✓						✓		✓				
Beth	✓	✓	✓			✓	✓	✓	✓	✓				
Henry	✓	✓	✓			✓	✓			✓	✓	✓	✓	✓
Stella	✓	✓	✓			✓	✓			✓	✓			✓

To find a methodological approach that accommodated the unique PL needs of participants, I followed literature recommendations for ensuring the PL's effectiveness, and provided participants with options that led me to consider the research design carefully.

Research Design

I sought to understand *how* primary school teachers in a low socioeconomic school effectively learned self-regulation knowledge and skills; what *enabled* and *constrained* their application of this learning; and what influence this learning had on their management of stress. As a result of this investigation, I also aspired to provide

teachers and leaders in similar contexts with recommendations for effective PL to support teachers' stress management. Described as "extended (iterative), interventionist (innovative and design-based), and theory-oriented enterprises whose "theories" do real work in practical educational contexts" (Cobb et al., 2003, p. 13), design-based research (DBR) methodology showed promise as an appropriate educational research approach for this investigation.

Evidence of growing representation in the literature suggested the affordances of DBR within educational research contexts (Anderson & Shattuck, 2012). Various researchers identified key characteristics found in DBR investigations (Anderson & Shattuck, 2012; Cobb et al., 2003; Crippen & Brown, 2018) and described different phases of research within the DBR process (Amiel & Reeves, 2008; Herrington et al., 2007). DBR was also promoted in the literature as an effective research process for understanding the potential of technologies for enhancing learning (Amiel & Reeves, 2008; Wang & Hannafin, 2005) aligning it well with my intentions to engage in video technology as a component of the PL I planned to offer.

DBR provided a methodological process conducive to the contextual complexity of my investigation. Proposed by Brown (1992) as a way to "engineer innovative educational environments and simultaneously conduct experimental studies of those innovations" (p. 141), DBR acknowledged the "whole operating system" (p. 143) and its integrated components (teachers and their training, students, learning content, learning technologies…). It focused on changes to this system as well as contributions to theory and practice (Brown, 1992; Crippen & Brown, 2018; Reeves, 2000). Rather than one-off interventions (often referred to as professional *development*) to effort quick change (Webster-Wright, 2009), DBR's iterative longitudinal nature supported slower evolutionary change through ongoing teacher PL.

DBR's methodological framework aligned with characteristics (shared in Table 2) synonymous with effective teacher PL (Darling-Hammond et al., 2017; Thompson et al., 2020; Timperley, 2008) through its iterative structure, focus of social engagement and collaboration, contextual situatedness, and focus on an intervention. This supported teacher change (Clarke & Hollingsworth, 2002) and the evolution of design

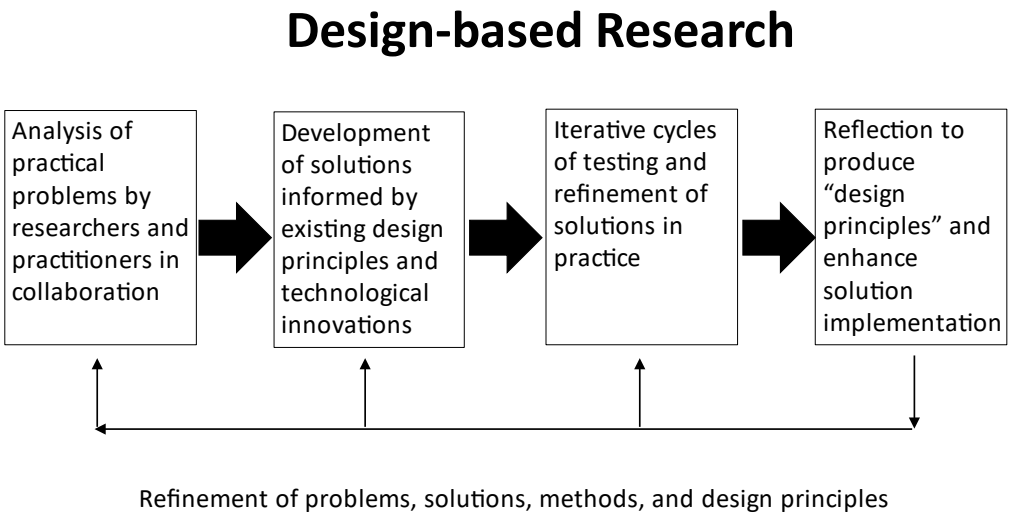
principles (Anderson & Shattuck, 2012). Furthermore, DBR promoted a pragmatic and reflexive mixed methods approach that allowed for the selection and application of methods based on their "utility for furthering the research project rather than because of their abstract "power" or refinement" (Herrington et al., 2007, p. 4094).

Characteristics of DBR

In the following section, I use the four phases of DBR described by Reeves (2006) to share the process I used for conducting this investigation (see Figure 14).

Figure 14

Reeves' (2006) Phases of Design-Based Research



I also intersperse evidence of the six key features of DBR described by Anderson and Shattuck (2012) as:

- Being situated in a real educational context;
- Focusing on the design and testing of a significant intervention;
- Using mixed methods;
- Involving multiple iterations;
- Involving a collaborative partnership between researchers and practitioners; and,
- Evolving design principles.

Characteristic of DBR: Situated in a Real Educational Context

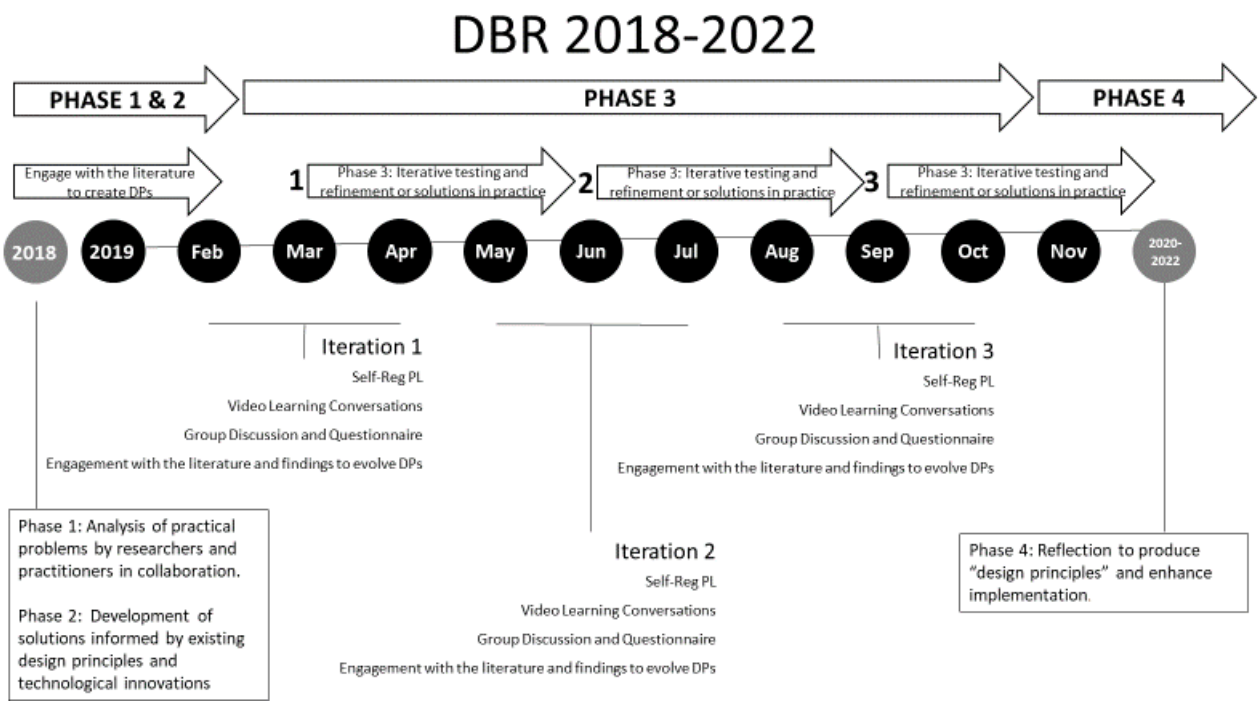
As a prelude to the first phase of DBR, it is important to note that this research was "situated in a real educational context" (Anderson & Shattuck, 2012, p. 16). Less formal engagement with participants and students occurred on the playground, in hallways, and in the staffroom, while various venues provided locations for more formal research components. PL sessions, group discussions, and questionnaire completion occurred in the school library, while video was taken in teaching and learning spaces across the school from regular classrooms to specialist classrooms like the Music and Drama space and the Green Room, depending on participants' teaching allocations during that time. Office spaces were provided for VLCs and the TORSH Talent video repository provided a virtual connection to the real educational context that enabled revisiting the learning context for further reflection.

Phases of DBR

Reeves (2006) suggested four phases within the DBR process along with ongoing refinement of problems, solutions, methods, and design principles. The first three of Reeves' (2006) phases involved all six of Anderson and Shattuck's (2012) DBR characteristics, while the fourth phase focused mostly on concluding the evolution of the design principles and writing up the research. These phases took place over five years within my research as depicted in Figure 15.

Figure 15

My DBR Investigation Across Reeves' Four Phases



DBR Phase 1: Analysis of Practical Problems by Researchers and Practitioners in Collaboration

I dedicated all of 2018 to establishing and building relationships with participants and familiarising myself with the context of my research. Through formal and informal opportunities to collaborate, the challenging nature of the context and the problem of stress management permeated conversations and observations. The reciprocal relationship between student and teacher dysregulation was acknowledged and the focus of teachers' stress management decided upon for the focus of the intervention.

Characteristic of DBR: Collaborative Partnerships Between Researchers and Practitioners

Crippen and Brown (2018) concurred with Anderson and Shattuck (2012) in placing collaboration "at the heart of DBR" (Crippen & Brown, p. 5) and the implications this has on "the need for an intimate working relationship and melding the priorities among a diverse team of people" (Crippen & Brown, p. 5). This collaboration was a priority and feature of my research. Participants informed and

guided the content and mode of PL and determined the timing and location for the various elements of the research. They requested resources (readings, videos, resources, and podcasts) and chose their level of involvement in the video component of the research. It was participants who instigated the sharing of videos with colleagues in the final iteration as they followed their curiosity on the application of Self-Reg.

Collaboration also occurred through regular researcher and participant meetings and the discussion and questionnaire sessions at the end of each iteration. Collaboration with VLC participants allowed for personalisation of their learning through mentorship. These researcher-participants partnerships created opportunities for sharing resources such as funding, video technology, human resources, and skills resulting in mutual benefits.

DBR Phase 2: Development of solutions informed by existing design principles and technological innovations

At the end of 2018, in collaboration with participants, we decided on the intervention - a series of three PL sessions focusing on Self-Reg - to develop teachers' self-regulation to support their ability to manage stress. Informing this PL were: the worldviews of pragmatism and constructivism (Creswell & Plano Clark, 2017); and the theoretical lenses of social constructivism, situated learning (Lave & Wenger, 1991), polyvagal theory (Porges, 1995, 1997, 1998), and Self-Reg theory (Shanker, 2013; 2020). Also employed were the four design principles for effective self-regulation PL underpinned by principles and values promoted by Timperley (2008), Darling-Hammond et al. (2017), and TMC (The MEHRIT Centre, 2018); the VIPP model (Juffer, 1993) to apply personalised video-enhanced PL for interested participants; and, the testing of TORSH Talent in iterations 2 and 3 as a repository and annotation platform.

As the 2019 school year commenced, three 10-week iterations of self-regulation professional learning were scheduled. Each iteration began with a PL session (with self-regulation content and the mode of learning guided by the participants from the feedback in the previous iteration), followed mid-iteration by an opportunity to engage in video feedback through a VLC, and ending with a whole group discussion and questionnaire.

Characteristic of DBR: Focused on the Design and Testing of a Significant Intervention

Another characteristic of a DBR investigation described by Anderson and Shattuck (2012) is the focus of the investigation on the design and testing of a significant intervention. My DBR investigation involved the designing and testing of one significant intervention within which two other interventions were also adapted/applied and tested. The most significant intervention was the Self-Reg PL. This PL occurred through workshops and VLCs. Within the VLC component, two other interventions were tested. I adapted the Video Intervention for Positive Parenting (VIPP) model (Juffer et al., 2008; 2017) to the primary school setting of my research to test it within this context. I also applied the TORSH Talent platform (already designed) to test the platform's potential for supporting educational research.

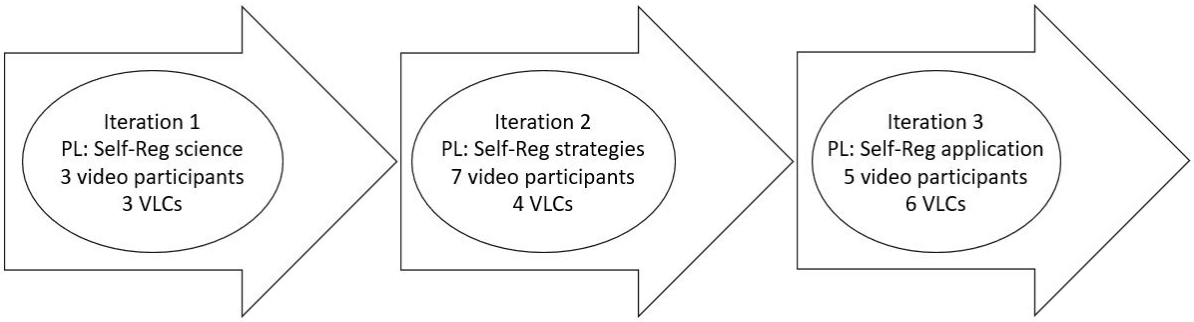
Self-Reg PL.

Self-Reg theory formed the foundation of PL I provided. Adding to other research featuring Self-Reg PL (Lisinski, 2022; Rosati, 2020) or suggesting the need for it (Burgess, 2021), this PL focused specifically on the teachers and leaders within the research context. It prioritised *their* growth in understanding and self-awareness of the brain/body response to stress and *their* personal responses when energy was low and tension was high (Thayer, 1996; 2003). The research components promoted the application of self-regulation knowledge and skills and provided opportunities for mentorship to connect theory to practice through VLCs.

Across the iterations, I collaborated with participants to ascertain their self-regulation PL priorities. They shared their areas of interest and I created PL workshops to address these requests through a Self-Reg theory lens. This personalised the PL for this group of participants (and may have looked different with a different group of people). For this group, the iterations of Self-Reg PL reflected their curiosities about the science of Self-Reg, Self-Reg strategies, and the application of Self-Reg (see Figure 16).

Figure 16

Self-Regulation PL Over Three Iterations



These PL themes of Self-Reg science, strategies, and application guided the focus for the VLCs which drew increased interest and participant engagement with each iteration. This research sought to investigate how the intervention of Self-Reg theory-informed self-regulation PL developed teachers' understanding and application of self-regulation knowledge and the influence this had on their stress management.

VIPP for Teacher PL.

The opportunity to be videoed and engage in a VLC to connect the Self-Reg PL to participants' practice was an optional component of the Self-Reg PL. This resulted in the adaptation and testing of the VIPP model, the second intervention within this research. The use of video to connect Self-Reg theory to participant practice was part of the primary Self-Reg PL intervention described above; yet the way this occurred within the research required a tested approach.

The VIPP model was first tested in 1993 (Juffer) to support sensitive parenting for adoptive parents with children around 10 weeks of age using personalised video footage of their interactions. Since this time, the VIPP model has been extended to include other family configurations and circumstances, including: new mothers with eating disorders (Woolley et al., 2012); children from birth to 6; children with specific needs such as autism VIPP-AUTI (Poslawsky et al., 2015); and, in daycare settings – VIPP-CC (Groeneveld et al., 2011). Specific focus on parenting using sensitive discipline VIPP-SD (Juffer, Struis, et al., 2017) also resulted in adaptations to the original VIPP model. I decided to adapt and test the VIPP process in the primary school setting to support teachers applying Self-Reg PL because of the iterative format and the

supportive approach used to provide participants with positive feedback on their application of learning. Additionally, the literature-evidenced success of VIPP interventions in other studies (Juffer et al., 2014; Juffer, Bakermans-Kranenburg, et al., 2017) affirming my decision. Table 4 shows how I adapted the VIPP model to my research.

Table 4

VIPP Adaptations

Characteristics	Established VIPP models	VIPP process adapted to my research context
Situated in real setting	Home and day care	Primary school
Role of the 'intervener'/researcher	Learning provider, videographer, mentor, and to "work with video feedback to initiate and consolidate processes" (Juffer et al., 2008, p. 6)	PL provider, videographer, mentor, researcher, and to work with video feedback to initiate and consolidate Self-Reg processes
Subjects of video	Parents and day care providers	Teachers and school leaders (participants)
Quality of relationship between intervener and participant	"supporting and empathetic" (Juffer et al., p. 5)	supporting, empathetic, growth promoting, encouraging
Targeted relationships	Parent-child; day care provider-child	Participant-self Participant- Self-Reg material Participant – Self-Reg practice
Indirect subjects and beneficiaries of video intervention	Children	Students
Modest number of sessions	Around six	Up to three video sessions and three PL workshops
Safe place to receive feedback	Home	Private meeting room or classroom at school

Characteristics	Established VIPP models	VIPP process adapted to my research context
Focus of video feedback	Feedback "provides a unique opportunity to promote parents' understanding of their child and also enables the reinforcement of positive moments in parent-child interactions" (Juffer et al., p. 6)	Feedback provides a unique opportunity to promote participants' understanding of Self-Reg concepts and enables the reinforcement of positive moments where these were applied
Phases of intervention	1. "Interveners build relationship with caregiver with an emphasis in their video feedback on child behaviour" (Groeneveld et al., 2011, p. 90)	1. Researcher builds relationships with participants with an emphasis in the VLC on Self-Reg PL
	2. "Improving caregiver behaviour by showing at what moments strategies work" (Groeneveld et al., p. 90)	2. Improving participants' self-regulation practice by connecting Self-Reg PL to participants' practice
	3. Review of feedback and information	3. Review of information and feedback
Learning focus	Various learning opportunities for parents of caregivers on themes of sensitive parenting and sensitive discipline	Professional learning for participants requested Self-Reg science, strategies, and application

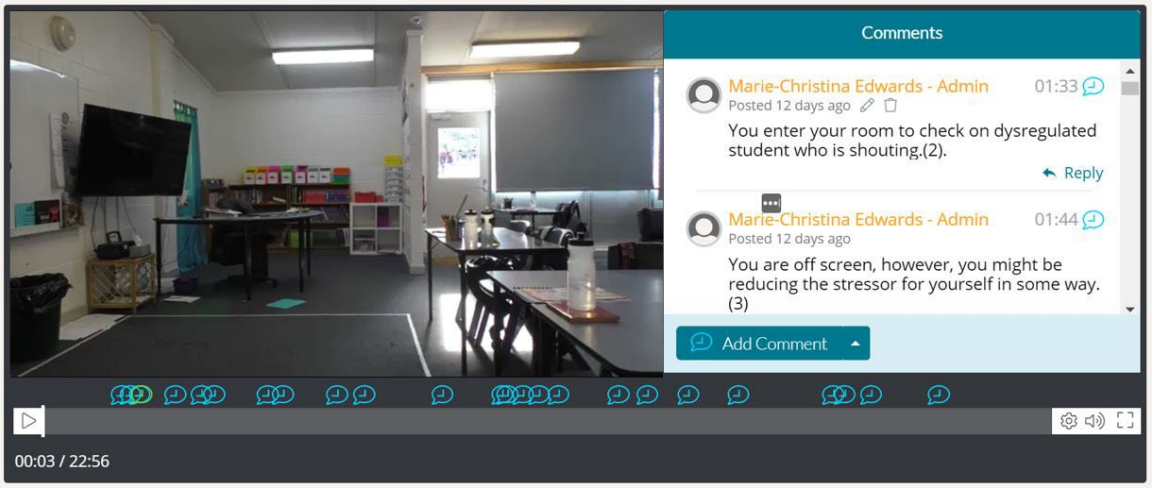
Characteristics of VIPP such as being situated in the real context, iterative, underpinned by trusted and collaborative relationships, and seeking to address real world problems through an intervention, complemented characteristics reported in the literature of effective teacher PL as well as characteristic found in DBR methodology. These correlations and the potential to test the VIPP model in another setting with different subjects, made it a conducive intervention to test within this research.

TORSH Talent.

The final intervention applied and tested in this research was TORSH Talent, a video repository and interactive platform enabling observation, reflection, feedback, and annotation of participants' self-regulation practice. Ten free licences for this platform were granted by the company to better understand the capacity of this platform to support research. The platform was used in the second and third iterations and served a number of functions enhancing the research process for both researcher and participant. Figure 17 shows a screenshot of video, annotation bubbles, time, and comments.

Figure 17

Example of TORSH Talent Screenshot



DBR Phase 3: Iterative cycles of testing and refinement or solutions in practice

Three 10-week iterations occurred across 2019; each informed the next and enabled me and the participants to deepen our "understanding of the phenomenon under investigation while the experiment [was] in progress" (Cobb et al., 2003, p. 12). Each iteration was collaboratively planned with participants as the interventions (self-regulation PL, VIPP model, TORSH Talent platform) were tested and refined. Between iterations, I analysed the findings from the previous iteration to extrapolate themes within the various data sources while engaging with the literature to guide the evolution of the design principles. This was also the time when participants nominated themselves for the video component in the next iteration.

Characteristic of DBR: Mixed Methods

Anderson and Shattuck (2012) further characterise DBR as employing a mixed methods approach for data collection and analysis. Three core mixed methods designs described by Creswell and Plano Clark (2017) as convergent design, explanatory sequential design, and exploratory sequential design, delineate the sequence and integration of qualitative and quantitative data. I used the convergent design in this research to merge and compare qualitative and quantitative results then interpret them together. Due to the high involvement of participants in shaping the research, the challenging nature of the context, and the identified problem of stress for participants within the context, I also added a participatory perspective to this core design. Creswell and Plano Clark described this as a "mixed methods participatory-social justice design" (p. 123) and suggested a flowchart of four considerations for implementation:

- Identify the problem and state the theoretical perspective;
- Conduct the data collection to involve and honour participants;
- Introduce an analysis that highlights the needs of participants or the community; and,
- Recommend change that needs to be made. (p. 127)

This participatory-social justice convergent design prioritized: participants' unique needs and concerns; the building of trusting relationships; and, the development of research questions and design principles that worked to affect positive change for the community. Data collection "honour[ed] stakeholder and participant perspectives" (Creswell & Plano Clark, 2017, p. 127), and used a variety of sampling strategies to ensure inclusivity of voice amongst participants and recognition of the diversity within the participant group. These strategies included data collection in each of the three iteration elements: PL sessions, VLCs, and discussion and questionnaire sessions. Additional data came from raw video data and my own reflections and anecdotes during my visits to the site. The schedule of data collection is depicted on Table 5.

Table 5

Schedule of Data Collection

Data collection dates	PL	Video	VLC	Questionnaire	Researcher reflections and anecdotes
Pre-iterations Feb-Oct 2018	✓			✓	✓
Iteration 1 Feb-Apr 2019	✓	✓	✓	✓	✓
Iteration 2 May-Jul 2019	✓	✓	✓	✓	✓
Iteration 3 Aug-Oct 2019	✓	✓	✓	✓	✓

PL session conversations.

Qualitative data came from recorded Self-Reg PL conversations at the beginning of each iteration. These recorded conversations, captured during PL sessions, were transcribed, reviewed, and then thematically analysed.

VLCs.

Mid iteration, VLCs provided another qualitative data set. These one-on-one conversations were inductive, in-depth, and unstructured. Three pre-selected personal video segments, showing the participant's positive examples of self-regulation were used as provocations for learning conversations, following the VIPP model (Juffer, 1993). Participants were invited to take the conversation in directions they found relevant. These conversations were used as additional PL opportunities involving further teaching and connection to Self-Reg theory. VLCs were also recorded, transcribed, reviewed, and thematically analysed.

Questionnaires.

There were four questionnaires administered across this investigation. One preceded the first iteration (see Appendix G) and the remaining three occurred at the conclusion of each iteration (see Appendices H, I, and J). Each questionnaire was created as a word document, printed in hard copy, and completed by consenting

participants within scheduled after school one-hour meeting times. Questionnaires were anonymised, and I remained out of participants' view yet accessible for questions while they completed them. Within a week of participants' completion and submission of questionnaires, I thematically analysed questionnaire data using Braun and Clarke's (2006) framework and the six steps of data analysis suggested by Creswell and Plano Clark (2017) (described in more detail later in this chapter).

Questionnaires included closed and open questions resulting in both quantitative and qualitative data. Quantitative data included participant details such as years of teaching experience and current grade level, their selection of items on lists, ranking responses, and selecting from Likert type scales (O'Leary, 2004). Open-ended prompts within questionnaires provided qualitative data as participants recorded personal examples, reflections, preferences, and comments. Questionnaires were used to understand participants' understanding and application of self-regulation, their experience of self-regulation PL, and to ascertain any changes in thinking, actions, or management of stress. The content and mode of PL was determined by participants' responses in questionnaires and the whole staff discussions that occurred during these sessions.

Researcher reflections and documents.

While conducting this research, I maintained a journal and collected other documents. The journal served as a tool within the research as I recorded experiences. It allowed me to practice reflexivity, defined by Berger (2015) as "turning the researcher lens back onto oneself to recognize and take responsibility for one's own situatedness in the research and the effect that may have" (p. 220) . One example noted in my journal was a participant's ongoing use of language from a PL not closely aligned to Self-Reg theory. I noted my own limbic response to this, and took time to reframe my own internal reaction to ensure that I continued to stay curious rather than judgemental about this. This recognition and response supported active reflection on how I responded to my data. Other documents collected included unsolicited emails and my own anecdotes of conversations or events occurring outside the formal data collection schedule. Although not formally analysed or coded, these

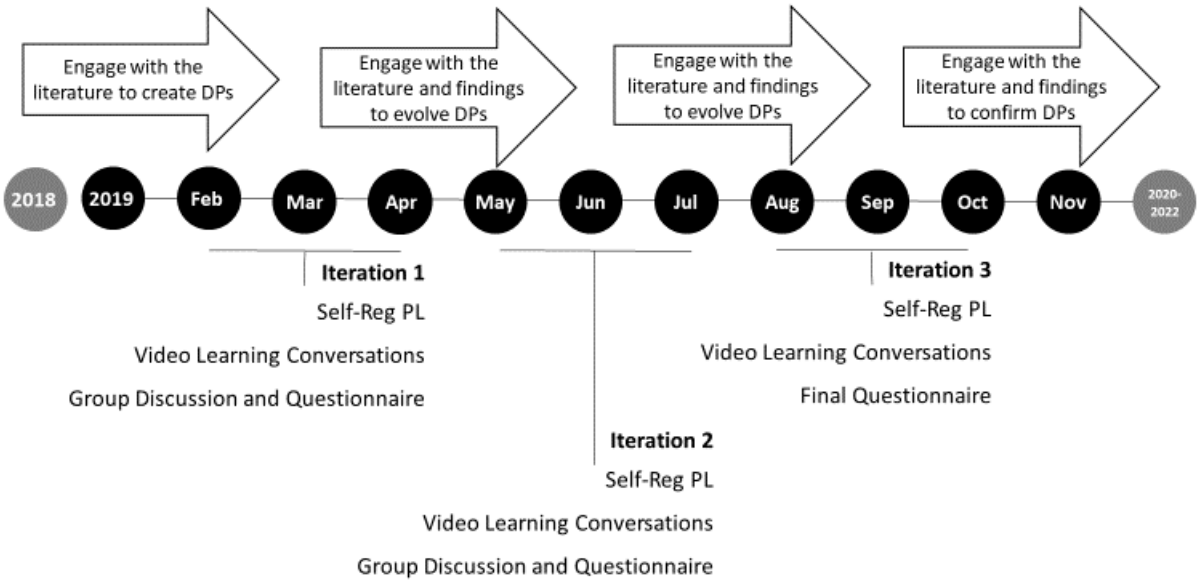
reflections and documents provided further opportunities for triangulation to validate or question the iteration findings across the research.

Characteristic of DBR: Multiple Iterations

The iterative nature of DBR is another characteristic cited by Anderson and Shattuck (2012) synonymous with this methodology. Iterations enabled cyclical testing of the interventions and the evolution of the design principles. My research included three iterations. Each iteration was approximately 10 weeks in duration and followed the same format of PL, VLCs, and group discussion and questionnaire (see Figure 18).

Figure 18

Schedule of Research Elements Within Iterations



DBR Phase 4: Reflection to produce "design principles" and enhance solution implementation

In the final phase outlined by Reeves (2006), evolved design principles were produced through reflection. Herrington et al. (2007) described these design principles as "scientific outputs" and "evidence-based heuristics" (p. 4095) that provide rich contextual detail affording others to consider their relevance in alternate settings. Along with scientific outputs, Herrington et al. (2007) also suggested DBR investigations can produce practical and societal outputs. Examples of practical

outputs included artefacts such as software or programs, while societal outputs resulted from the collaborative professional learning.

Reflection was an integral part of the iterative cycles within my research and the reflective process at the end of the final iteration resulted in refined DPs. I synthesised the DPs while engaging with the literature to inform the overall findings of the research. Along with scientific outputs were potential artefacts coming from the research and a deeper understanding of the enabling and constraining factors of the interventions within the research. With an intense focus on professional learning, the potential for significant societal output was present as this research invited all involved to engage in and benefit from learning and applying self-regulation knowledge and skills. Enhanced solution implementation to address the problem of teacher stress within this challenging context was navigated and informed through the phases of DBR, the application of DBR's distinctive characteristics, and the scientific, practical, and societal outputs (Herrington et al., 2007) resulting from the research.

Characteristic of DBR: Evolution of DPs

The evolution of DPs was the final characteristic described by Anderson and Shattuck (2012), setting DBR apart from formative evaluation or laboratory experiments (Barab & Squire, 2004). Design principles "detail the characteristics that are required of the features of an intervention and the conditions under which they must exist, in order to affect the desired outcomes" (Crippen & Brown, 2018, p. 4) and "advance a theoretical agenda, to uncover, explore, and confirm theoretical relationships" (Barab & Squire, p. 5). As described in the literature review in the previous chapter, the four original DPs for effective self-regulation PL: Establish and maintain professional relationships; ensure relevant and effective dissemination of knowledge and skills; apply new learning often and across contexts; and, engage in feedback with others, were established through engagement with the literature and evolved across the research:

These four DPs provided the required characteristics for the PL intervention and "necessary conditions" (Crippen & Brown, 2018, p. 4) to enable participants to develop self-regulation knowledge and skills to support stress management; however, they were not stagnant. These principles were applied and then scrutinised against

the findings of the first iteration and the literature to ascertain the ways in which they should change, remain the same, or be removed. The culmination of each iteration signalled this process of scrutiny, adjustment, and justification, and shaped how the DP would move forward into the next iteration. This research included three iterations that resulted in a set of evolved principles and consideration of implications for the future.

To summarise the research design, the phases and characteristics of DBR were applied providing the methodological approach for this research. A problem was collaboratively determined by participants and researcher; solutions considered and planned using design principles, an intervention, and technology; iterative cycles of testing and refinement through data collection and engagement with the literature unfolded; and, evolved design principles, solutions and recommendations culminated the project. The phases of research were predominantly conducted within the context of the school; focused on the interventions of Self-Reg PL, VIPP model for VLCs, and the TORSH Talent platform; used qualitative and quantitative methods for data collection and analysis, involved three iterations, were underpinned by collaborative researcher-participant partnerships; and, evolved DPs through engagement with the findings and literature as the iterations unfolded.

Data

In line with the mixed methods participatory-social justice convergent design (Creswell & Plano Clark, 2017) described earlier in this chapter, I analysed the qualitative and quantitative data within each individual iteration as they occurred in the data collection period while simultaneously recognising and responding to participants' energy and tension states and needs. VLC analysis occurred mid iteration and questionnaire analysis at the end of the iteration. These analyses were used in conjunction with the literature at the end of iterations 1 and 2 to evolve design principles and at the end of the final iteration to address research questions and suggest future implications. This schedule is summarised in Table 6.

Table 6

Schedule of Data Analysis

Data collection period	PL data analysis	VLC data analysis	Questionnaire data analysis	Review all data analysis
	Beginning of iteration	Mid iteration	End of iteration	Post iteration
Pre-iterations Feb-Oct 2018	✓		✓	✓
Iteration1 Feb-Apr 2019	✓	✓	✓	✓
Iteration 2 May-Jul 2019	✓	✓	✓	✓
Iteration 3 Aug-Oct 2019	✓	✓	✓	✓

Miles and Huberman (1994) described many strengths of qualitative data including how "they focus on naturally occurring, ordinary events in natural settings" (p. 10) providing rich and holistic accounts and revelations of complexities within these contexts. This was true within my research as the qualitative data provided "thick descriptions that [were] vivid, nested in a real context, and [had] a ring of truth that [had] strong impact on the reader" (Miles & Huberman, p. 10).

Quantitative data within this research were never intended to purport significant universal claims due to the small number of participants within the study; however, these data allowed for participants' perceptions of experiences of stress (using documents such as the energy and tension snapshot in the PL sessions) to be captured, as well as cohort demographics, PL preferences, and perceptions of degrees of importance and engagement with various aspects of the research to be numerically represented. The final section of the end of iteration 3 questionnaire, gave an example of how the quantitative data provided interesting patterns in participants' thinking and actions related to their engagement (or non-engagement) in PL opportunities. These data converged with the 5 domain approach to PL from the evolution of the DPs

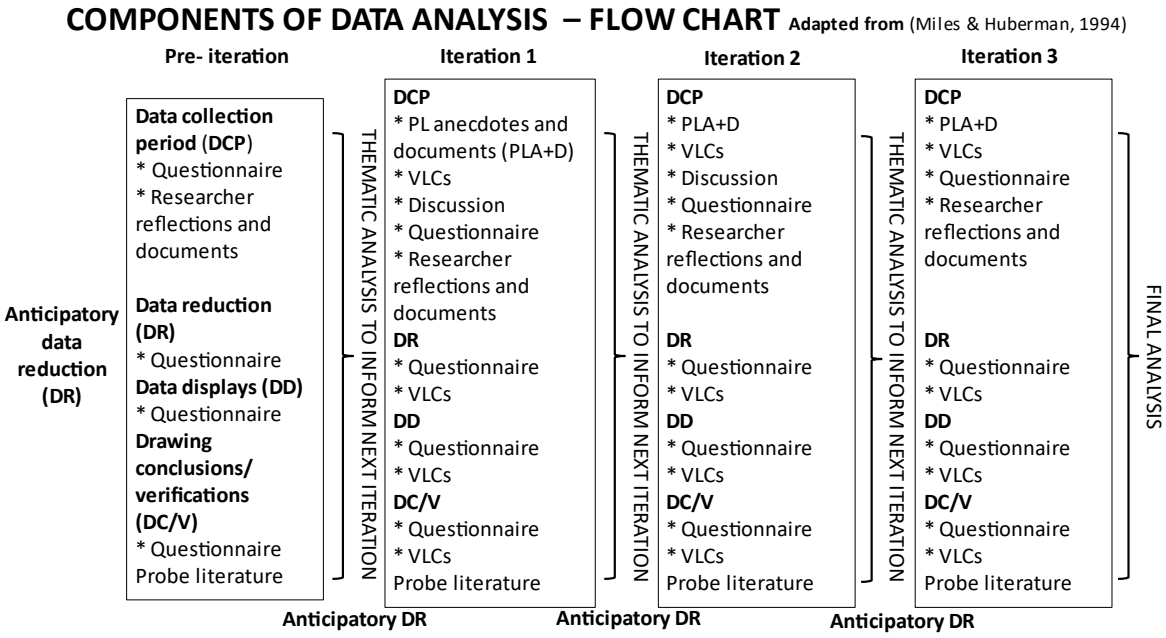
and invited further research in the field of effective PL for educators experiencing high stress.

Data Collection and Processing

In preparation for collecting, organising, viewing, and analysing data, I researched structures supportive of the evolution of the DPs, the testing of interventions, and the exploration of research questions. I adapted the flow model of the components of data analysis (Miles & Huberman, 1994, p. 10) to reflect the iterations and aspirations of DBR. I also maintained Miles and Huberman's four components of data analysis, including the data collection period (DCP), and the "three concurrent flows of activity" (p. 10): data reduction (DR), data display (DD), and conclusion drawing and verification (CD/V) (see Figure 19).

Figure 19

Component of Data Analysis Flow Chart



Data collection period.

There were four data collection periods as indicated in Table 6. Data for the pre-iteration period were collected through a PL session and questionnaire at the end of 2018 to inform the structure and content of the first iteration and to capture participants initial understandings and experiences of self-regulation (see Appendix H). Three subsequent data collection periods (comprising of Iteration 1, 2, and 3)

occurred over 2019, each spanning approximately 10 to 14 weeks and including a schedule of various methods of data collection, including PL anecdotes and documents (see Appendix L), VLCs, discussions, questionnaires (see Appendices I, J, K), and researcher reflections and documents.

Data Reduction.

PL anecdotes and documents, transcribed VLCs, transcribed discussions, questionnaires, and researcher reflections provided a rich source of valuable data that required reflexive reduction in order to authentically reflect participants' experiences, understandings, and perspectives within the research context. Miles and Huberman (1994) described data reduction as "the process of selecting, focusing, simplifying, abstracting, and transforming the data" (p. 10). They argued that researchers often begin this process (consciously or unconsciously) before data are collected as an anticipatory act while they consider various research questions, frameworks, and approaches.

Although I collected data from a variety of sources, data reduction began early in the research as I focused primarily on the data from questionnaires and VLC transcriptions due to the compelling and detailed evidence they provided and how they informed the DPs, research questions, and testing of interventions. Other data sources, such as PL anecdotes and documents, discussions, and researcher reflections, served as triangulation data allowing me to: confirm or challenge findings and remain reflexive around my own self-knowledge; understand the role participants and I played in the creation of knowledge; gain insight into the impact of my own biases, beliefs, and experiences; and, have caution around considering potential personal and universal claims drawn from data analysis.

Further reduction came as I examined questionnaire and VLC data through coding responses, identifying themes, and summarising data. This process of data reduction continued beyond each iteration as I reviewed previous iteration summaries and as I condensed and distilled key themes to discuss my findings in Chapter 7 of this document.

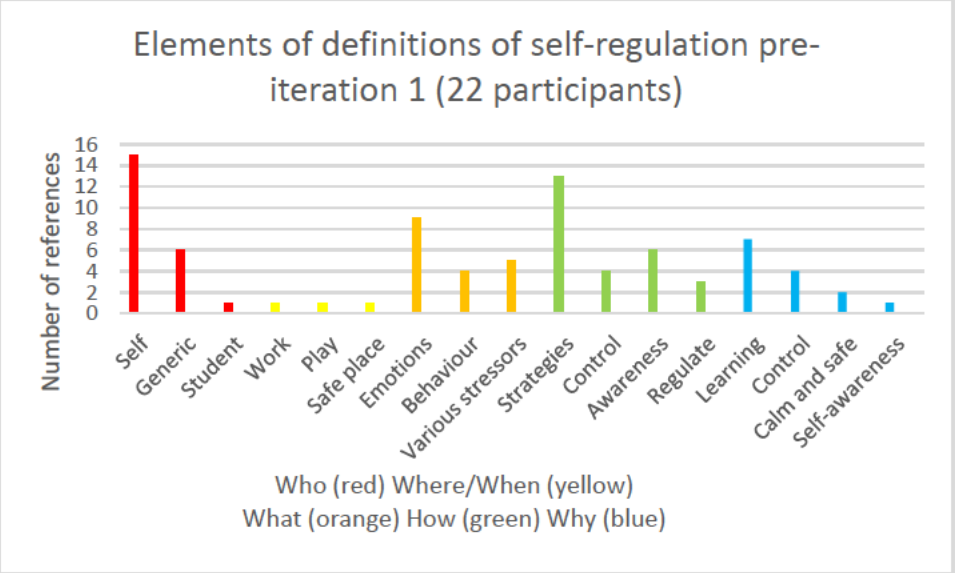
Data Display.

Displaying data supported further analysis and data reduction and provided an alternate way of communicating the themes I detected. The following is not intended to share results, rather, the intent is to give examples of the process I engaged in to display data to support analysis. Data displays also gave opportunities for comparison to detect growth and change across the research. The sequence described here provides an example of this from the first and last questionnaires.

1. Questionnaire prompt: "What does the term 'self-regulation' mean to you?"
2. Participant responses were coded for references to who, where/when, what, how, and why within their definitions. Response example: "being able to get yourself into an optimal space for learning or functioning best at work, play etc." This response indicated who- self; why – to be in an optimal space for learning and functioning; and, where – work, play.
3. Participant responses were collated according to the coding (see example of analysis of pre-Iteration 1 questionnaire - Appendix M and end of Iteration 3 questionnaire -Appendix N) and displayed graphically. Figure 20 provides an example of this.

Figure 20

Example of Data Display



Displays made it possible to see shifts in some of these definition components as will be described in the next three chapters.

Conclusion Drawing and Verification.

Drawing and verifying conclusions made up the third analysis activity recommended by Miles and Huberman (1994). The iterative structure of the research, and the act of evolving DPs between each iteration, gave natural pauses and opportunities to begin the process of drawing conclusions. This structure also created authentic verification opportunities. Verification occurred in three ways: I reviewed any previous iteration data and findings after analysing the most recent iteration, which resulted in repeated scrutiny of the data; I collaborated closely with VLC participants to verify findings; and, I used the data from PL anecdotes and documents, transcribed whole group discussions, and my own researcher reflections to triangulate the findings from the questionnaire and VLC data for further validation or challenge. Time embedded in the context also supported verification as I observed changes in participants' application of self-regulation learning. Through these processes, I constantly and iteratively reviewed data and challenged findings through regular engagement with the literature as part of the evolution of the DPs. This iterative process and review of data analysis gradually formed, then strengthened, conclusions as the research progressed.

Data Analysis

The process of data analysis within this research, like the DBR methodology, was iterative. I analysed qualitative data collected through VLCs in the middle of iterations and the qualitative and quantitative data collected through questionnaires were analysed at the end of iterations. Additional data collected within each iteration through PL anecdotes and documents, whole group discussions, and researcher reflections supported triangulation (indicated in Step 6 of Table 7) and opportunities for reflexivity.

Table 7 provides a summary of my process of data analysis employed within each iteration using the six steps suggested by Creswell and Plano Clark (2017, p. 210). Elements indicated by an asterisk (*) are further detailed in Table 7.

Table 7

My Research Aligned With Creswell and Plano's (2017) Steps of Data Analysis

Creswell and Plano Clark's steps in data analysis	Mid-iteration VLC	End of iteration questionnaire
Step 1: Prepare the data for analysis	Send VLC recording to Rev.com for transcription Read Rev.com transcriptions while listening to recording and make amendments to ensure accuracy Print transcripts for coding and analysis by hand Organise data by participant	Arrange printed questionnaires numerically according to the five-digit participant code (2-digit birthdate; first 2 letters of favourite colour; 1 digit for number of siblings) Create a database to collect responses
Step 2: Explore the data	Read through VLC printed transcripts while listening to the recording Pause recording to note expressions not captured in words (e.g., laughter, tears) Develop potential codes and coding lists*	Read through completed questionnaire Enter participant responses into the database Denote potential trends and codes/themes relevant to each question*
Step 3: Analyse the data	Implement the coding process by using codes to support the research questions, DPs, and the intervention of self-regulation PL • Code data • Group codes into themes • Consider how themes relate	Implement coding process • Code questions • Group codes into themes • Consider how these themes inform the research questions, DPs, and the self-regulation PL
Step 4: Represent the data	Show data in matrices (see Appendix O), graphs, written summaries, and participant quotations	Create data displays to represent questionnaire question responses

Creswell and Plano Clark's steps in data analysis	Mid-iteration VLC	End of iteration questionnaire
Step 5: Interpret the data	Review data representation Summarise these findings (see Chapters 4, 5, and 6) (example – see Appendix Q)	Draw preliminary conclusions from data analysis and review the questionnaire findings through the lens of the RQs, DPs, and the self-regulation PL. Record interpretations on a data analysis summary form*
Step 6: Validate the data and results	Review original recording and transcription to check result validity Triangulate VLC data analysis results with data from PL anecdotes and documents, transcriptions of whole group discussions, researcher reflections Review and check analysis results with VLC participants	Review data analysis summary form against original data and data displays to ensure accuracy of representation Triangulate questionnaire data analysis with data from PL anecdotes and documents, transcriptions of whole group discussions, researcher reflections Validate questionnaire findings by "spending extended time in the field" (Creswell & Plano Clark, 2017, p. 212) engaging with participants in their context

Coding.

I manually coded data as part of the thematic analysis of VLC qualitative data and for some of the qualitative questionnaire data. Braun and Clarke (2006) described six phases of thematic analysis including "familiarising yourself with the data; generating initial codes; searching for themes, reviewing themes; defining and naming themes; and, producing the report" (p. 87). Table 8 provides an example of codes generated after a preliminary read of transcripts. (See Appendix P for an example of coded VLC pages).

Table 8

Example of Codes

Theme	Node title	Code	Node title	Code
Regulation	Self-regulation	SR	Coregulation	CR
			Co-regulation Teacher - student	CR T-S
			Co-regulation Student - student	CR S-S
			Co-regulation Teacher - teacher	CR T-T
			Co-regulation Teacher-Admin	CR T-A
			Co-regulation Admin - Teacher	CR A-T
Stress	Negative stress	NS	Student stressors	SS
	Positive stress	PS	Teacher stressors	TS
	Increased stress	IS		
	Decreased stress	DS		
	Stress leave	SL		
	Accumulated stress	AS		
	Temporary stress	TS		
Self-Reg	Biological domain	BD	Reframe	R1
	Emotion domain	ED	Recognise	R2
	Cognitive domain	CD	Reduce	R3
	Social domain	SD	Reflect	R4
	Prosocial domain	PD	Restore	R5
Strategies	Strategy – non-medical	STR	Strategy medical	STR-MED
	Quiet space	STR - QS	Natural	STR-MED-N
	Yoga	STR - Y	Prescription	STR-MED-P
	Breathing	STR - B		
	Clapping	STR - CL	Applying strategy	A-STR
	Chimes	STR - CH	Teaching strategy	T-STR
	Affirmations	STR - AFF		
	Essential oils	STR - EO		
	Gratitude	STR - GRA		
	Drumming	STR - DR		
	Drama	STR - DRA		
	Art	STR - ART		
	Drawing	STR – ART-D		
Environments	Non-work environment	NWE	Work environment	WE
	Home	NEW-H		
Design Principles	Relationships	DP R		
	Dissemination of information	DP DI		
	Application	DP A		
	Feedback	DP F		

As coding progressed, I added and adjusted codes to capture the language features of my dialogue and the participants' dialogue. For my dialogue in VLCs, I tallied instances when I engaged in direct teaching, explaining, stating, confirming, clarifying by paraphrasing, clarifying by questioning, appreciating, suggesting, praising, direct questioning, and reviewing. I also recorded language features and themes from participant dialogues.

Upon completion of coding all the VLCs in the iteration, I reviewed them collectively to determine overall themes. These data were powerful in identifying broad themes and capturing the personal experiences of VLC participants. Chapters 4, 5, and 6 describe these further.

I also coded data for some questions within the questionnaires. For example, the self-regulation definitions previously mentioned in this chapter in the 'data display' section were coded and analysed according to their inclusion of statements indicating what, where, when, why, who, and how. This allowed for understanding how their definitions changed over the course of the research and Self-Reg PL intervention.

Data Summaries.

Data were summarised regularly across the three iterations of research as well as collectively at the conclusion of the final iteration. I summarised data in written notes, graphic displays (as shared in the previous section), and powerful quotations for VLCs (last six pages of Appendix R). I used data analysis summary forms for questionnaires (see example in Appendix Q). These forms captured the data event (e.g., iteration questionnaire), date, time, number of participants, and purpose of the data collection event. The form then provided prompts to support the summary including:

- What were the main themes/issues?;
- Summarise information you got (or failed to get) on the target questions;
- Any other points of interest;
- New questions; and,
- Relevant literature.

At the conclusion of the final iteration, I created a final summary in preparation for writing this dissertation. Three iterations of data analysis, each informing the research questions, DPs, and interventions culminated in a final cycle of data reduction, data display, and conclusion drawing and verification. In preparation, I listened to all the VLC recordings again, reread the transcripts and reviewed the summaries, and I reviewed all data analysis summary forms from the questionnaires to create a display on the wall of my office. This display acted as a condensed expression of my research including, iterations, evolution of DPs, literature, themes from data analysis, recommendations, and implications, and it became a dynamic interface as I considered effective ways to discuss and share my findings (see Figure 21).

Figure 21

Wall Display

Chapter 3 Summary

In this chapter, I outlined: the worldviews of pragmatism and constructivism; the theoretical lenses of social constructivist theory, situated learning theory, polyvagal theory, and Self-Reg theory; the DBR methodological approach; and the mixed methods used to collect data. I described my own reflexive practices and the ethical considerations that I maintained as I worked within a challenging context supporting participants as they engaged in the various PL and data collection options within the research schedule. The phases and characteristics of a DBR methodological

approach were described and applied demonstrating the structure and integrity of the research process. The chapter concluded with a description of how data were collected, coded, reduced, displayed, analysed, summarised, and verified.

This chapter provides an appropriate segue into the following three chapters where these research findings are iteratively shared. Chapter 4 focusses on the first iteration of research, how I prepared for it, the three research elements within the iteration, and the implications stemming from Iteration 1 for Iteration 2.

Chapter 4: Iteration 1 Findings

Engaging With Neuroscience

The DBR methodology used for this investigation was described in Chapter 3. In this chapter, I begin to share the findings from the iterations of research conducted over 2019. Chapter 4 focusses on Iteration 1.

Preparations for this research occurred across 2018 followed by the completion of the first iteration from February 28 to April 4, 2019. To describe what occurred, I have divided this chapter into five parts:

- Preparation for Iteration 1;
- Professional learning (PL);
- Video learning conversations (VLCs);
- Group discussion and questionnaire; and,
- Implications for Iteration 2.

Preparation for Iteration 1

My own experience as a teacher and administrator guided me as a researcher and invited reflexivity. I understood the complex, busy, and often challenging nature of schools, the precious commodity of educators' time, and the value expected from PL. These understandings drove me to learn as much as I could about the participants and their context before commencing any research to ensure that I used their time thoughtfully and efficiently and personalised the PL to address specific participant needs.

I used the year leading up to the commencement of the first iteration to establish and build relationships with participants, students, and other school staff, and to develop an understanding of the unique and challenging nature of the context. This included a series of classroom visits to work alongside participants and students in every grade, and spent time in other areas of the school (for example: the staffroom, the playground, and the front office) to engage in informal conversations. I also attended other school-wide PL sessions related to self-regulation alongside participants.

Drawing from these experiences, I personalised the first Self-Reg PL session at the conclusion of this introductory year. This session was a precursor to the commencement of Iteration 1 and included a participant questionnaire. Participants' responses to this questionnaire, combined with my classroom experiences, informal conversations, formal research meetings, and engagement in the concurrent PL with participants, informed and shaped the content and structure of Iteration 1.

Iteration 1 occurred in the first 10-week school term of 2019. The iteration included three research components: PL on February 28th (available to all participants); VLCs mid-March (for self-nominated participants); and, a group discussion and questionnaire in April (available to all participants). The focus for the learning centred on three self-regulation topics, requested by participants through the questionnaire the previous term.

Professional Learning

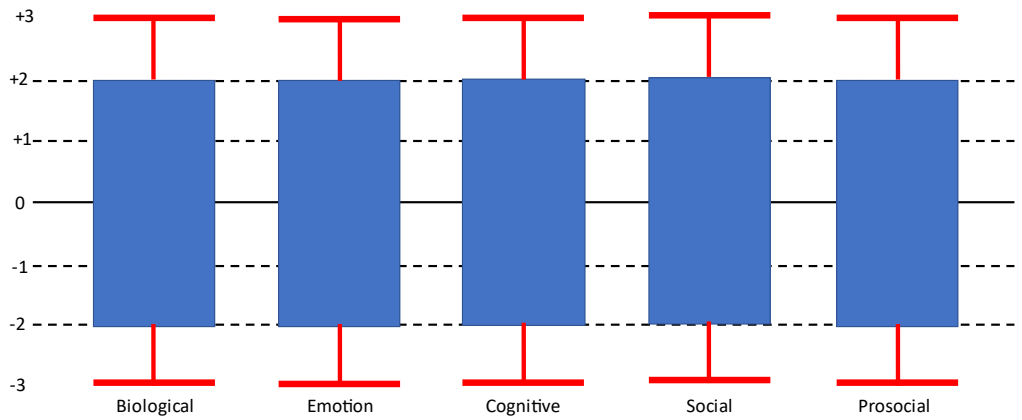
The first research component was professional learning. Participants were curious to learn the neuroscience behind self-regulation and I personalised the session to accommodate this. The learning was delivered as a one-hour after school presentation and was held in the school's library where participants sat in four table groups of four to six people.

I presented an overview of the planned research, covered requested learning content, and provided an opportunity for participants to apply the learning. The session included:

- an introduction (that covered the concept of stress, established a PL space, and described how data would be collected);
- an overview of the research design and research questions;
- Self-Reg topic 1 - The effects of excessive stress on the brain;
- Self-Reg topic 2 - Reframing behaviour;
- Self-Reg topic 3 – The 5 domains of stress;
- an opportunity to request additional resources;
- a group task: Brainstorm of teacher stress behaviours; and,
- an independent task: Completion of the energy and tension snapshot (see Figure 22).

Figure 22

Energy and Tension Snapshot



For the final independent task, I created a box and whisker graph that I referred to as an *energy and tension snapshot.* Participants mapped their energy and tension across the 5 domains. A coded system provided anonymity for this task. They considered how they felt in each domain and whether the energy they were burning left them feeling depleted (indicated by a negative number) or invigorated (indicated by a positive number). For example, a participant who had a headache and felt hungry may have plotted this as a -1 or -2 in the biological domain, and a participant who was excited to be learning about Self-Reg and felt engaged and energised by this may have plotted this as a +1 or +2 in the cognitive domain. Any plots on the red whiskers of the graph indicated a state of dysregulation; this indicated a depletion or invigoration so great that it interfered with the participant's capacity to function well. Completing the snapshot immediately engaged participants in applying their learning. In addition, participants were invited to annotate what might be causing their energy to fluctuate in this way.

Findings From PL

There were three sets of data gathered during the PL session. The first set consisted of my written observations as participants arrived at the library afterschool for the Iteration 1 PL session. The second set of data was generated from a group task

where I invited participants to brainstorm examples of teacher stress behaviour. The third set of data was an individual energy and tension snapshot graph, capturing participants' energy and tension across the five domains along with additional annotations explaining their choice of placement.

I observed participants as they arrived for the first Thursday afterschool PL session. They looked exhausted and quickly began sharing and comparing their stressful day. Some announced these across the room to colleagues, whilst others confided quietly to someone in closer proximity. Many brightened as they noticed the food laid out at each table. One commented about feeling positive once they realised I was presenting, remembering that I provided food at the previous PL session. Another revealed that dealing with issues at lunchtime made it impossible for them to eat, quickly followed by their appreciation of the opportunity for some food. Some participants joked as they negotiated where people should or should not sit according to the snacks available. There was loud banter and laughter amongst some, whilst others sat staring before organising themselves for the session.

After being introduced by a member of the administration team, a participant shared their gratitude for the focus of this PL prioritising teachers' learning to manage their stress, and that the focus of learning was not about the students this time. Many participants made remarks in agreement, confirming that the opportunity to focus on their own wellbeing was relevant and appreciated. As the session commenced, other participants raised specific and personal questions; for example, what to do when things are so challenging that you feel like just walking out of the classroom; how to build a toolbox of strategies and ideas to help teachers on the job; and ways to incorporate mindfulness for stress relief.

These observations and comments initiated my consideration of potential themes for thematic analysis of Iteration 1 data. They indicated that teachers experienced high tension from the stressful work environment, depletion of energy across a variety of domains, and how they regulated stressors with food, and by engaging in or avoiding social interaction, and even by finding relevance and value in the PL. I also observed relationships between people (participant to participant, and

participant to me) as well as early signs of a growing relationship with the material/content.

After the research was described and the PL content delivered, participants explored and applied the learning through two tasks. The first task was a group task. Participants were asked to list possible stress behaviours that teachers show. The second task was the independent and anonymous completion of an energy and tension snapshot shown in Figure 22.

Participants listed examples of stress behaviours shown by teachers. I collated these examples after the session into Shanker's (2013) five domains:

- Biological: Lack of energy, headaches, teeth grinding, doing too much, poor sleep, eating fast food/comfort food, drinking alcohol/ substance use, feeling hungover at work;
- Emotion: Crying, getting angry, no/low tolerance, yelling/ raising voice, less patience, overreacting, feeling negative, frustrated, over-thinking;
- Cognitive: Inability to think, distraction, loss of motivation, loss of interest, less organised, out of routine;
- Social: Becoming non-responsive, not visiting staffroom at lunch time, lack of communication, low tolerance with family, unstable work/life balance, social avoidance; and,
- Prosocial: Defensive – taking things more personally, becoming disengaged, taking days off work.

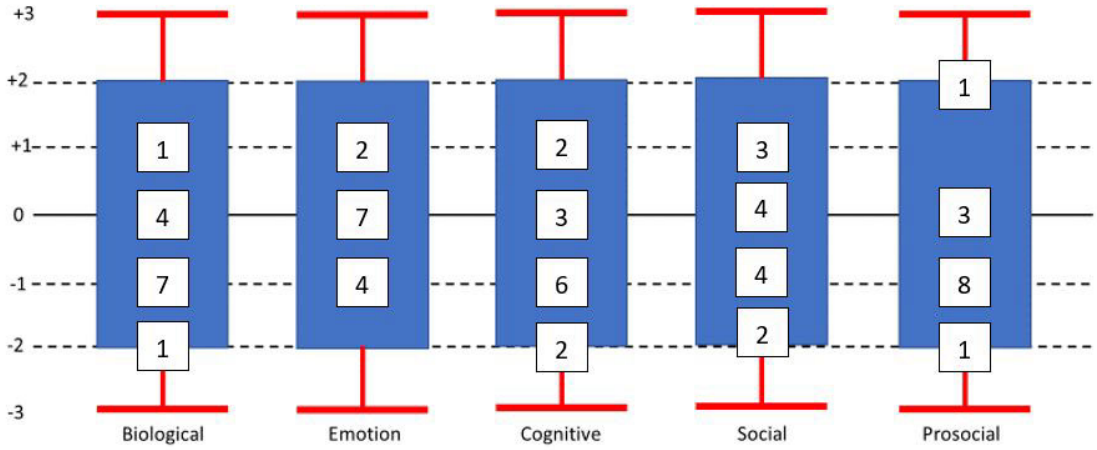
This list and the conversations at tables among group members repeated themes from earlier observations. The examples reiterated the high stress of the work environment and the tension this caused in participants, the diversity of stress symptoms and behaviours across all domains, and suggested strategies of self-regulation that were maladaptive (for example: drinking alcohol which may reduce stressors in the short term; however, creating further stress feeling hung over at work), rather than growth-promoting.

The second task was the optional completion of the energy and tension snapshot seen in Figure 22. All participants considered the energy they were burning in each domain and recorded an individual snapshot. As part of the data reduction and

display process during analysis, participant responses were collated to show how many participants placed themselves in each section of the snapshot (see Figure 23).

Figure 23

Collation of Participants' Energy and Tension Snapshots



Participants provided additional details to justify and explain their responses on the snapshot. Examples across the domains included:

Biological

- Positive: "I played basketball last night, so I'm feeling alright" (Recorded as +1)
- Negative: "I need more exercise" and "I'm feeling unwell" (Recorded as -1); "I'm tired, out of energy and out of routine" (Recorded as a -2)

Emotion

- Positive: "My are emotions are +1 because I had a fine class today"
- Negative: "Really drained and upset by how the day went" (Recorded as -1)

Cognitive

- Positive: "I'm enjoying thinking a lot and wanting to find out how to use this to improve my practice." (Recorded as +1)
- Negative: "I can't think, I don't want to think." "I can't concentrate fully." "I'm tired." (Recorded as -1)

Social

- Positive: "I am good, social interaction is something I still seek" (Recorded as +1)
- Negative: "I am going home to sleep." (Recorded as a -2)

Prosocial

- Negative: “I am worrying about Pop,” “I’ve got lots of outside school jobs I need to get done,” “Low energy means people are down,” and “I’m worried about my pup crying at home all day.” (Recorded as -1) “I won’t get to see my grandkids tonight.” (Recorded as -2)

The data from this snapshot gave evidence of both positive and negative stressors from outside the workplace that had possible implications inside the workplace. This was not evident in the initial observations, referred to briefly in the group brainstorm (particularly in the social domain), and more clearly articulated in this snapshot. One participant noted their invigoration from playing basketball the previous evening (almost 24 hours later) registering this as a +1 on a Thursday afternoon after teaching all day. In contrast, the lack of exercise prompted another participant to record a depletion of energy of -1. Interesting to note were concerns for family members or pets registering -1 and -2 scores in the prosocial domain being experienced whilst in the work environment.

In summary, there were three themes from the PL session data. The first was the high stress of the work environment (evidenced as coming from stressors both within and outside the environment) causing high levels of tension. The second was the unique and diverse experiences of stress the participants had across all five domains. The final theme demonstrated the diversity in self-regulation strategies (growth-promoting and maladaptive) that participants reported.

Video Learning Conversations

I invited all participants to take part in the video component of this research. In the first iteration, Isabel, Lynda, and Larissa volunteered. This provided a small piece of quantitative data as a reference point for future iterations. My pre-established relationships with two of the three video volunteers came from concurrent attendance at PL the previous year. This provided us with many opportunities to connect and have professional discussions about self-regulation and teaching in challenging contexts. Both cited this pre-existing relationship as a contributing factor to their involvement in the video component of the research.

I collected video footage of the three participants teaching in their learning spaces and reviewed them on the same day in preparation for the next day's VLCs. These conversations required additional human resources as they took place within the school day. A senior administrator created the timetable and organised a teacher to cover the classes for participants to meet with me. Prior to this meeting, I pre-selected examples of self-regulation from the footage, recorded the time these occurred on the video, and noted justifications for how these reflected self-regulation learning in action.

The purpose of the VLC was to share evidence of the participant's application of PL and for the participant to ask questions, seek clarification, and engage in discussion further personalising their learning. In this iteration, the pragmatics of navigating the video footage to find these exemplars, finding the corresponding handwritten notes, and discussing them was less smooth than desired. The conversations were rich; however, the navigation to video samples and connecting this to my annotations often interrupted the flow of conversation as the exact section of video was located, shared, and reflected upon. The participant was only able to view their practice and engage in conversation about it during the assigned 45-minute learning conversation release time.

The following sections share the findings from each participant's learning conversation. Each is prefaced with the context of the lesson, followed by an explanation of the three examples of self-regulation chosen. Further insight into the experience of each video participant is shared based on the conversations that unfolded. A summary of the video findings concludes this section before the data set from Iteration 1's group discussion and questionnaire are reported.

Findings From Isabel's VLC

Isabel was the first participant videoed. Her video captured a spelling lesson. She worked with a small group while other learners were assigned activities in groups around the room. The three video segments selected for discussion provided different examples of self-regulation. The first example centred on Isabel's concern for a student who could not be located and served as an example of prosocial stress. The second was when she used the strategy of redirecting a student to be independent in

solving their problem to allow her to continue working with a small group. The third was the use of laughter to keep a situation light when a child had made an irreversible mistake with a task.

As the VLC unfolded, Isabel gave context and insight into the challenges she faced and the strategies she used when working with her students. She shared the diverse needs of her students, highlighting one who was violent towards her and other students, yelling, swearing, and throwing tantrums. She reported being attacked by him with a plastic bottle full of liquid as he screamed, “fuck you” over and over at her. He also repeatedly screamed, “I want to die,” as he was exiting the room. Isabel noted that he would often freeze before a violent outburst, and she regularly evacuated the other students from the classroom to keep them safe. This student had a weighted blanket and at the time of the video was asleep under it. Isabel had just returned to work after a sick day, taken as restoration in response to the accumulated stress primarily associated with this student.

During this conversation, Isabel identified a variety of additional stressors. These included:

- constant multi-tasking including teaching, announcements, questions, listening, the classroom phone ringing, and student behaviour;
- managing combinations of students whose various stressors often triggered stress responses in others;
- stress associated with the empathy and worry for a student experiencing violence within her home, relocation, and stress-based behaviours of hurting others and crying;
- organisational stress from her sick day (taken due to stress);
- technology challenges in the classroom;
- having a volunteer who was taking students to do an activity in the Art room;
- exhaustion felt from smiling all the time when she didn’t feel like it; and,
- the number of people who needed her attention.

Isabel reported her application of self-regulation strategies focused on students' needs, not her own. Through our conversation we identified some strategies that served to reduce *her* stressors. These included:

- teaching students to be independent;
- being kind and smiling;
- being organised;
- having systems and routines in place (although these take a lot of energy to set up);
- laughter;
- seeking to remain calm so that her own behaviour did not escalate others; and,
- time away from students.

At certain times during the learning conversation, Isabel spoke with a shaky voice and twice she cried. She explained that she was not upset, just exhausted. There were also instances where Isabel laughed. The laughter was usually not because something was funny but more an expression of exasperation and disbelief.

Isabel described the video experience as "definitely an eye opener," confirming that relationships mattered to her in this process. She commented, "it doesn't worry me anymore," as she explained her relationship with me had eased the anxiety she felt being videoed. She was also amenable to sharing sections of her video with the two other colleagues videoed in this iteration.

It was clear that additional adults in the room were generally a support. The teacher assistant provided co-regulation; however, in this instance, the volunteer was a source of stress. Isabel felt the pressure to put the volunteer to good use to ensure her time was not wasted, at the same time as recognising that the activity was interrupting the learning program.

Findings From Lynda's VLC

Lynda was videoed straight after recess. She facilitated a sharing circle to support her students transition from the playground to the classroom, then assigned a handwriting exercise for students allowing her to follow up with one student who was dysregulated by an incident at recess. This was followed by a quiet free choice activity.

Lynda's VLC began with a review of the domain snapshot that she completed prior to being videoed. It captured significant stressors in the prosocial domain due to her mother being ill. Lynda also indicated heightened personal stress from experiences with four students in her class. Additional stressors included unusual or unexpected behaviours causing distraction to her teaching and student learning.

I selected video segments that included the sharing circle Lynda facilitated to check in with students after recess, her one-on-one debrief with a student to process a dysregulating recess event, and later in the lesson where she continued to support this student who was behind in his work because of the debrief. Lynda's language was consistently linked to the Zones of Regulation program (Kuypers & Winner, 2011). This was the language using with her students in the sharing circle and was also evident in the one-on-one debrief with the student.

Like Isabel, Lynda prioritised supporting students with their self-regulation stating, "I'm more worried about their needs than my needs and making sure that their problems are solved in some way, and then hopefully they're ready for the next part of the lesson." She had not considered herself a priority for self-regulation prior to this learning conversation. There was also a perception that Lynda felt targeted by student behaviour. This was illustrated as she said, "I just feel that he's trying to upset me, he's trying to make it difficult for me to teach." Student behaviour driving her own dysregulation was evidenced when she stated, "She can put me in a not very nice zone. I can go from zero up to 10 with her straight away. She was doing this to me and making me react, though I tried not to."

Throughout the conversation, Lynda shared her emerging self-regulation strategies as well as those her students were using. Her personal strategies included:

- counting from one to 10;
- self-talk;
- taking a calm approach;
- talking aloud with her students (this is how I am feeling and why);
- one-on-one debriefs with students;
- explicitly teaching students strategies;
- warning of any changes in the routine/expectation; and,

- individual approaches.

Lynda experienced shifts in her thinking. She credited the PL sessions for this. An element of this learning was the importance of finding calm. She explained her application of this learning,

> I do lots of talking in my head at the moment, lately, yeah, talking, thinking - Okay I need to just talk calmly, because I know if I talk calmly, then they'll be calm, and then I'm going to be calm.

The additional insight gained from viewing her video enabled Lynda to witness herself in action. She described how it gave insight into her own regulation in the biological domain as she witnessed how she used movement to keep herself regulated as she taught.

Lynda explained that her pre-established relationship with me underpinned her decision to be videoed and engage in a VLC about her application of self-regulation. She described how my work the previous year, teaching in her classroom and providing PL to the staff, had given her the confidence to volunteer to be videoed and receive feedback to extend her learning.

Findings From Larissa's VLC

Larissa's video captured a Music and Drama lesson just prior to the lunch break. She had completed her personal energy and tension snapshot and was ready to receive her students when I began videoing. As students lined up to enter the room, a violent incident erupted in the hallway. One student held another student up against the wall with both hands around his neck. There was swearing and physical struggle as Larissa and another staff member intervened.

The first video segment I selected for our conversation was this incident. We discussed her response to this threat as well as the students' responses. We watched how she supported their collective restoration back to calm. The second video segment showed Larissa choosing a particular student for a leadership role within the lesson. This student often showed dysregulated behaviours in class and the specific role supported his ability to regulate within the lesson, consequentially lowering Larissa's stressors. The final section captured how Larissa used clapping for up-regulating herself and focusing her students' attention.

In this conversation, Larissa described the challenges of working in this context. Being sworn at and abused were common occurrences with her tolerance and energy diminishing as the week unfolded. She provided explicit details about the physical altercation between the two students in the hallway and she described her need to “survive” in the job with its “harrowing circumstances and tough clientele.” She described physical tension in her body, her heart racing, and feeling weary, all signs of biological stressors. In addition, she reported feeling emotional deficit and having the experience of her mind racing. She emphasised the impact this had on her home life. Larissa shared various proactive strategies she employed before work so that she could “survive” and manage the stressors experienced as a direct result of her work context.

Upon reflection, Larissa credited sources outside of work for the development of her self-regulation knowledge, skills, and strategies. This list included yoga, meditation, naturopathic medicines, essential oils, affirmations, breathing exercises, drumming group, and practising gratitude. She described her deliberate application of these strategies to support her with the challenges of her work.

The conversation had a strong social thread. Larissa valued the support she received from colleagues, shared how she connected friends and colleagues to yoga retreats, and evidenced her initiation of self-regulation opportunities for a small group of colleagues at school. There was strong evidence of a culture of co-regulation between her and her colleagues. Sick days were used as a coping strategy by staff when things got too much, and Larissa indicated that there was great understanding for this among staff. Driven to speak out for wellbeing, Larissa advocated that self-regulation needed to be considered at an Education Department and community level. She acknowledged that the leaders within her school understood its importance and insisted a broader view and approach was necessary.

Larissa expressed how valuable the practice of videoing teachers was. She did not consider it necessary to have a pre-existing relationship with the videographer and was motivated to participate in this part of the research due to the interest she has on the topic of self-regulation. This video experience had highlighted her own use of

clapping to self-regulate, however beyond this example, she did not consider that being videoed had given her a greater understanding of self-regulation.

Summary of Findings From VLCs

Common themes were found across all three learning conversations. The high levels of stress from daily violence, abusive language, and dysregulated behaviour and the resulting biological, emotion, cognitive, social, and prosocial stressors participants experienced as a result were clearly and consistently articulated. One video participant reported personal stressors from outside of school that created additional stresses at school; another indicated the school stressors affecting her at home. All participants shared strategies they used to manage stress and a curiosity for learning more about self-regulation. Participants' learning was not limited to the PL component of this research as they referenced other programs and out-of-school sources in the learning conversations.

Video participants spoke of taking sick days to cope with the stress, prioritising student self-regulation over their own, and their own prosocial stress of worrying for dysregulated students. Isabel and Lynda indicated the reason for their involvement in the video component was their familiarity with me from previous PL. For them, having a relationship with the person videoing mattered. For Larissa, it was the relationship with the content of the professional development that led to their engagement in the video component.

Evidence of the excessive stress these participants were experiencing occurred across all the conversations and across all the domains. In the emotion domain, there were tears of exhaustion and exasperated laughter, and experiences of increased heart rate (biological domain), a racing mind (cognitive domain), and a feeling of being burned out. For Larissa, there was also a deliberate and strategic approach to applying a variety of strategies to combat the stress of work, both for herself, and for others. These conversations gave a window into the complex and challenging context participants were working in, where teaching and learning was often secondary to managing student and personal dysregulation.

Group Discussion and Questionnaire

The final data sets for Iteration 1 were collected from a group discussion and questionnaire conducted in the last staff meeting of the school term in April 2019. Staff arrived at the library 15 minutes after dismissing their classes on a Thursday. Four tables were grouped to accommodate four to six people and food and stationery supplies were provided. The agenda for the meeting included:

- a review of the research questions and design principles;
- a recapitulation of the three focus topics for PL;
- additional support materials (vignettes and reading materials);
- an opportunity for video participants to share their experiences;
- an invitation for participants to be part of the video group in Iteration 2;
- consultation regarding mode and content for Iteration 2; and,
- completion of the questionnaire (see Appendix I).

The purpose of the questionnaire was to capture all participants' self-regulation experiences during the first iteration. Reflections on self-regulation application, both positive or negative, were invited. Questions explored shifts in practice with prompts "Before I… Now I…" and sought to understand the contexts, frequency, and subjects specific to the self-regulation experiences. PL from earlier in the term was reflected upon and plans for the content and mode of the next iteration's learning suggested.

Findings From Group Discussion

The 16 participants present at the meeting had the opportunity to discuss and reflect upon Iteration 1 and give input on learning for Iteration 2. Participants suggested specific learning content and requested preferred modes of delivery for the next iteration. The group conversation also enabled sharing of experiences, something the video participants enthusiastically opted into.

The group discussion was framed by the three research questions and the four design principles. Participants discussed each question and principle in their table groups and then recorded their responses.

Research Question 1: How did you develop self-regulation knowledge and skills?

Participants shared 10 modes of learning that supported their development of self-regulation knowledge and skills. Listed from most reported to least reported, these included:

- presentations;
- completing the energy and tension snapshot;
- learning about the brain;
- learning about the 5 domains;
- learning about the levels of arousal and through reflection;
- discussion;
- mentorship;
- applying strategies; and,
- increased self-awareness.

Participant comments included: “Being able to separate stressors into the 5 domains helps identify them better,” and “Understanding the triune brain [helped develop knowledge and skills].” Three participants referred to how the snapshot was useful. The following comments demonstrated this: “The use of the personal snapshot diagram helped to identify stressors and feelings,” and “The snapshot helped me identify stressors and how to negate them,” and, “Snapshot useful. Not to do all the time but be mindful of.”

Research Question 2a: What enabled you to apply self-regulation knowledge and skills?

Participants gave feedback enablers to their application of self-regulation knowledge and skills. Thematic analysis found nine themes (recorded here from most reported to least reported):

- social engagement;
- self-awareness;
- time;
- increased ability to identify stressors;
- ability to be in a calm state;

- personal strategies;
- confidence;
- motivation; and,
- other's needs.

Social engagement through discussions and support was indicated as enabling the application of self-regulation. Participants' statements supporting this included: "Talking to another teacher and getting that support," and "I am able to [apply self-regulation knowledge and skills] when I have support from others and if a student needs support more than me." Self-awareness was another common response with participants indicating how their ability to "identify stressors," "recognise my attitude and motivation levels," have "awareness of my triggers", and have "knowledge of self and activities to help regulate that work," enabled application. Time was another significant enabler including time to think, embed, be quiet, and catch breath to settle self.

Research Question 2b: What constrained your application of self-regulation knowledge and skills?

The leading factors that constrained participants' ability to apply self-regulation included time, workload, and the dysregulation of other people (particularly students). Participants identified time as the biggest factor constraining the application of self-regulation knowledge and skills. This was strongly linked to workload. Comments affirming this included: "Too much to do at one time," "So much going on at school and outside of [school]," and "No break and overall exhaustion both physically and mentally." Student dysregulation also constrained their ability to self-regulate. Participants indicated challenges to self-regulate stemmed from "student behaviour - trauma/dysregulated – not being able to focus on all, even myself," "too many dysregulated students," and "witnessing extreme dysregulation daily."

Research Question 3: In what ways has this learning/application influenced your stress management?

Analysis of participants' responses to the final question, "In what ways has this learning/application influenced your stress management?" resulted in four themes. These were:

- an increased ability to identify stressors;
- increased self-awareness;
- knowing or needing to know more strategies; and,
- impact of personal stressors on students.

The second part of the group discussion invited participants to reflect on the four design principles (DP) for PL about self-regulation. Upon reflection on *DP1: Establish and maintain effective relationships,* one participant agreed that this was "very important" and another suggested that it "may help to have a mentor on staff to debrief with." Participants agreed that *DP2: To ensure relevant and effective dissemination of knowledge and skills* was needed and there were specific requests to "go further with examples" and have "more discussion". *DP3: Apply new learning often and across contexts* was considered as "needed" and "important," while *DP4: Engage in feedback with others*, received a more mixed response. One participant commented, "really interested – how we can be supported more as a school to look after our mental health," another considered this "too personal", whilst a third queried how possible this was to do.

This meeting also provided an opportunity for the three video participants to share their experiences. Isabel, Larissa, and Lynda enthusiastically shared their video and VLC experiences with the other participants. They shared anecdotes, vulnerabilities, and overall excitement at having accepted the opportunity. All three declared that they would choose to be involved in this experience again in Iteration 2. The invitation to be videoed and engage in a VLC in the next iteration was extended to all the participants at the end of the meeting with a few indicating they would consider it.

Findings From Questionnaire 1

Directly after the group discussion, the 16 participants in attendance at the meeting completed a questionnaire (see Appendix I). The week prior to giving this questionnaire, conversations with some participants at a concurrent PL session helped me understand the stress levels at the research site were higher than usual. Taking this into account, I adjusted the opening question to allow participants to focus on what they thought was important or current to share. The resulting questionnaire provided five prompts. These invited:

- personal reflections (positive and negative) on self-regulation experiences;
- feedback and suggestions regarding PL;
- reflection on the influence learning about self-regulation was having on managing stress;
- identification of the contexts, people, and regularity of applying self-regulation knowledge and skills for stress management; and,
- an indication of topics and modes for the next iteration of PL.

Q1 Prompt 1: Personal Reflections on Self-Regulation Experiences

Participants described both positive and negative aspects of their self-regulation experiences. Themes arising from this prompt that were deemed positive included increased self-awareness, co-regulation, a growing understanding of helpful strategies, and a shift in school culture. Those deemed negative were the frequency and intensity of challenging behaviours, the accumulative nature of the stress they experienced, and participants' overall experience of low energy and high tension.

Participants reflected on their increasing self-awareness. This included noticing how certain personal traits affected others. For example, one participant reported how they modified the volume of their voice due to increased awareness of how their loud voice was dysregulating others. Another participant noticed an increased awareness of employing self-regulation strategies in high stress situations. Finally, a third participant shared their efforts to be positive and a problem solver, indicating that when they were unable to do this, others were impacted.

The concept and practice of co-regulation was reflected upon by participants. Examples of this were, "Trying to coregulate a student is almost useless if we as

teachers are not regulated," and "When students have challenging behaviours it's hard to self-regulate." The following comments pointed to modelling self-regulation and developing a shared language, "The more teachers share their self-regulation strategies with students, the more they begin to recognise when they are not calm, and the more willing they are to implement strategies." One participant shared how most students in the class were lovely and the effect of this was calming in stressful situations.

Practical examples of strategies were mentioned throughout the responses. These included non-verbal communication, decisions to reduce stressors, restoration activities, whole-class calming activities, and self-talk reminders not to take student behaviour personally.

Shifts in school culture was another theme extracted from the data. There was a sense of excitement that staff were experimenting with and exploring self-regulation. Attitudes were changing towards regulation, strategies for self and student regulation were being applied, and a new language was emerging. One participant felt the benefits of a significant change in their role at the school, resulting in improved personal stress management. Frustration was also shared regarding some staff not being on board and seeing self-regulation as "playing."

Challenging behaviours such as aggression, abuse, defiance, and disrespect were reported. Specific examples of events involving these behaviours were shared. One participant described being hit in the face with a lanyard and being able to stay calm and access support. Verbal abuse including swearing, relentlessly calling out of a teacher's name, and negative comments were reported.

The accumulative nature of stress was evident. Mantras of "each day is a new beginning" and "breathe and repeat" when facing the daily need to support student self-regulation were shared. The feeling of patience being tested, difficulty getting out of bed to go to work, and the "fourth student who needs my support to self-regulate getting the brunt of my frustration."

Low energy and high tension were inferred. Teachers shared their experience of being more easily upset and less tolerant. As one teacher stated, "Self-regulation

strategies only take you so far when you have been verbally attacked for the twentieth time."

Q1 Prompt 2: Feedback on Iteration 1 PL

The questionnaire prompt invited feedback on the PL in Iteration 1. Time, content, and mode were the concepts shared by participants. Additionally, general comments indicated participants felt supported and confident to seek advice, that concepts were modelled, and mentorship was available. One participant observed people were "opening up their classrooms" suggesting increased willingness to engage with others and share practice.

The timing of PL received varied comments. The timing of the three research components (PL, video, questionnaire) was received positively, as it "allowed time for reflection and action." Short vignettes with recapped or additional information were appreciated by some for their brevity. There was strong sentiment that PL needed to remain in allocated staff meeting time. Additional resources, requested by participants and provided by me, had no allocated viewing time in school hours, and were subsequently not prioritised by some participants who explained there were too many additional school commitments to compete with.

The most useful content from Iteration 1 was highlighted by participants as the 5 domains of stress and scanning these domains to ascertain where stressors lay. Some participants applied the domains to consider the stressors they carried from home to work or conversely, from work to home. Participants shared their growing curiosity about learning strategies to managing this.

The modes of learning included face-to-face workshops, one-on-one video feedback sessions, vignettes, and readings. The variety of modes were enjoyed and allowed for differentiation among the participants, meeting different needs, interests, and preferences for learning. Access to material was reported to be easy, although one found it more challenging and gave up. Face-to-face learning allowed for conversations and questions and gave further reason for viewing and reading to occur within the school schedule. Participants showed curiosity for seeing self-regulation in action through videos, and those who had been videoed gave positive feedback about this experience. One participant reported gaining a better understanding of how they

self-regulated, what they said and what they did, through the video experience. Comments regarding the reading included gratitude that it was “short and sweet”, while others reported that it was “too much” or “jargon-heavy”. One participant requested Australian research.

Q1 Prompts 3: Influence of Self-Regulation Learning on Stress Management

The third prompt asked participants to consider their learning about self-regulation and any influence it had on their management of stress. They were invited to frame their response using the format, “Before I…, Now I…”. An example of a participant’s response showing the application of PL was: “Before I tried not blaming students for behaviour, now I ask, why?” An analysis of the responses resulted in five themes categorising perceived influence: change in priorities; transitions; awareness; communication; and social.

Q1 Theme 1: Changes in Priorities.

Participants noticed how they were prioritising growth-promoting modes of self-regulation more. These included statements indicating prioritisation of intentional self-care, for example, “Before I would go home and not have anything planned, now I go to the gym, cook, walk, listen to music or podcasts on my headphones” and “Now I am willing to put my mental health first, I employ strategies when I am not coping like yoga, meditation, and I plan long weekends. I took two days off in the middle of the term to break it up.” It also included establishing bounded work times, “Before I used to take work home, now the lap top only comes home on the weekend.”

Q1 Theme 2: Transitions.

Another way the learning was influencing stress management was in transitions. Participant comments that inferred this included: “I’m identifying ways to regulate from one situation to another” and “I’m identifying a third space between work and home.” The latter comment suggested this “space” was enabling them to keep the stressors from these two contexts separate.

Q1 Theme 3: Awareness.

Self-awareness about self-regulation was growing. An increased awareness about the speed of stress reactions was noted by one, “Now I take longer to escalate when annoyed, verbally assaulted, or a student is refusing to follow instructions.”

Another identified personal strategies that helped reduce stress, “I have an increased awareness of things that calm – reading, chatting, brushing my cat, bingeing on Netflix.” A third reported a new awareness of self-regulation occurring throughout the day, “Now I’m aware that I self-regulate during the day and am learning HOW I do this.”

Q1 Theme 4: Communication.

Self-regulation learning also influenced stress management through communication. Connecting with others by, “listening and sharing instances,” was reported by a participant as, “a great part of stress management on the self-regulation journey.” Ways of communicating were also changing with an increased understanding of self-regulation. This was evidenced by one participant who noted, “Before I got upset, raised my voice, noticed a lot of distractions and acted immediately, didn’t talk to others and reflected alone, now I really think and act only when necessary, try to be calm, use a soft voice, not get upset, talk to close friends, family and teachers, ignore some behaviours, count to 10.”

Q1 Theme 5: Social Engagement.

The power of learning as a group reportedly reduced stress due to “the combination of ‘own’ learning and ‘others’’ learning at the same time.” This united approach to “learning about self-regulation with colleagues who experience the same stressors” was experienced positively. For one participant they reflected, “Before I would try to solve problems alone, now I take a break and seek support.” Co-regulation through social engagement was experienced as a positive way to manage stress.

Q1 Prompt 4: Where, With Whom, and When was Self-Regulation Being Applied?

Participants were invited to consider “in which contexts/locations, with whom, and how often [they found themselves] deliberately applying self-regulation knowledge and skills for [their] own stress management?” Locations included both inside and outside of school. School was reported 13 times, home reported four times, and golf once. The classroom context was report by one participant as a location that “can be lonely and difficult to self-regulate and coregulate – you cannot leave the students.”

Consideration of who was involved when applying self-regulation prompted colleagues, students, teens, and friends to be listed. These groups of people were referred as both responsible for reduced stressors as well as increased stressors. One participant perceived students were "trying to push my buttons," to deliberately cause stress.

Responses to the frequency of self-regulation being deliberately applied ranged from specific times (like recess and lunch or days off) to broader time spans (constantly, a lot, regularly, several times a day). The preference for time alone was shared by one participant. One participant indicated that they were using self-regulation "more now than before." There was hope shared by one participant who reiterated, "Things can be fixed, it might take time."

Q1 Prompt 5: Participants' Suggestions for Iteration 2 PL

The final section of the questionnaire informed the planning of PL for the next iteration. It gave participants the opportunity to voice their choices of PL content and the modes they preferred. Learning about strategies with specific links to Self-Reg theory was the most frequently requested topic. Further exploration of co-regulation, ways to identify you need help, and work stress versus home stress were also requested. Two participants wanted an opportunity to review the PL from this iteration and another stated "more of the same." The requested modes of learning included, discussion, PowerPoint presentations, short readings, and video clips (possibly TED talks).

Implications for Iteration 2

The conclusion of Iteration 1 marked an important point in the design-based research process. It allowed for reflection on pragmatics such as the three-part format of the iteration, and the content and mode of PL. Feedback from participants was instrumental in shaping the design (structure, content, and mode) of Iteration 2. Furthermore, it prompted engagement with the literature and Iteration 1 data, promoting reflection on design principles for PL on self-regulation.

The three-part structure of the iteration was well received by the participants within the constraints of the school timetable. Participants reported that PL was challenging after teaching all day. After long and stressful days, participants frequently

reported depleted energy which made it difficult to engage fully in their own learning. Staff meetings were scheduled from 3:15 until 5:00pm two days per week and alternative times were not negotiable. Consequently, the timing of PL in Iteration 2 remained the same; however, finding a more conducive time for teacher PL is a recommendation for further consideration.

Participants requested workshops as their preferred mode of PL for Iteration 2. They enjoyed the learning and collegial discussions this mode afforded. A variety of other modes were also solicited and included in the planning. This demonstrated the unique approach each learner brought to their learning. Some requested videos, others asked for podcasts, for some reading was their preferred mode to learn. Implications for Iteration 2 were that I sourced and created a variety of learning materials to meet participants' requests both in content and mode.

The most significant shift when planning for Iteration 2 was the PL content. Iteration 1 focused on the *science* of self-regulation. At the end of this iteration, participants' interests shifted to learning self-regulation *strategies*. Their curiosities extended beyond their school evidenced by requests to learn how other professionals (specifically emergency service providers) managed stress. The implications for Iteration 2 included the creation of PL based on the Self-Reg theory intervention focusing on strategies, combined with additional resources regarding how emergency service workers managed stress. Further implications in preparation for Iteration 2 were to ensure additional information was provided in the modes participants requested and that time within the school day be available to view these.

The culmination of the first iteration was a catalyst for reviewing the four design principles through the lens of Iteration 1 data and the literature. This review focused on each principle to validate its inclusion as a principle within the research and justify any changes, make clarifications or raise questions prior to moving to Iteration 2. The discussion in Chapter 7 will connect the findings from Iteration 1 to the literature and describe how this resulted in the evolution of the four design principles and informed the three research questions.

Chapter 4 Summary

In this chapter, I shared the findings of Iteration 1. PL focused on the science of Self-Reg including the brain/body response to excessive stress. Learning topics included: the Triune Brain (MacLean, 1990), the hierarchy of stress responses (Porges, 2001), and applying the 5 domains of stress (Shanker, 2013) in a personal energy and tension snapshot. Themes from the data confirmed the high stress environment, participants' unique and varied stress experiences, and the maladaptive and growth-promoting strategies they employed. VLCs highlighted that relationships with people were part of, but not the only reason for, participating in VLCs; relationships with the learning material also needed consideration. Preliminary insights into the three research questions showed emerging examples of *how* participants were learning self-regulation knowledge and skills, and what *enabled* and *constrained* this. Changes were noted by participants in transitions, awareness, communication, and social engagement as they intentionally applied the learning from our self-regulation PL. Some noted a shift in school culture. While iteration 1 focused on the science of Self-Reg, participants requested Self-Reg strategies as the focus for Iteration 2.

The following chapter presents the findings for Iteration 2. It is organised similarly to this chapter describing preparation for the iteration, followed by the findings from the three research elements within the iteration, and concluding with implications for Iteration 3.

Chapter 5: Iteration 2 Findings

Exploring Self-Reg Strategies and Video PL

This chapter focusses on results from the second iteration of the research which occurred from April 29 to July 5, in Term 2 of 2019. As in the previous chapter, the focus of this chapter is to share the findings from the three research components. Therefore, the chapter is structured as follows:

- Preparation for Iteration 2;
- Professional learning (PL);
- Video learning conversations (VLCs);
- Group discussion and questionnaire; and,
- Implications for Iteration 3.

Preparation for Iteration 2

I prepared for Iteration 2 in reflexive, pragmatic, and scholarly ways. As with Iteration 1, my previous years as a teacher and administrator supported insightful preparation as a researcher and involved a reflexive praxis. I communicated clearly and prepared thoroughly to minimise disruption to school routines and honour the precious commodity of participants' time. Addressing pragmatics, I arranged PL session times with senior administrators, booked technical equipment for videoing, and arranged access to the TORSH Talent platform for the seven participants who were interested in being videoed. I also used participants' feedback from Iteration 1's questionnaire to shape the PL content, mode, and timing. My engagement with the literature as I analysed findings from Iteration 1, allowed for scholarly reflection and supported the evolution of the design principles (discussed further in Chapter 7). This preparation resulted in notable similarities and differences between Iteration 1 and 2 (see Table 9).

Table 9

Similarities and Differences Between Iterations 1 and 2

Research components	Similarities from Iteration 1 to 2	Differences from Iteration 1 to 2
Design Principles	Main concepts of design principles stayed the same	Each principle was adapted to reflect Iteration 1 findings and engagement with literature
Professional Learning	PL sessions occurred after school on Thursday PL mode was a workshop	PL in Iteration 1 focused on the science of self-regulation, Iteration 2 focused on strategies
Video Learning Conversations	Isabel, Lynda, and Larissa from Iteration 1 chose to continue	An additional four video participants joined TORSH Talent platform activated as a repository for learning conversations video and annotations
Questionnaire	13 questionnaire participants responded to questionnaires in Iteration 1 and 2	Four participants responded to Iteration 2 questionnaire only (3 had completed the pre-research questionnaire but not Iteration 1, and one was new to the research)

The design principles evolved to reflect the synthesis of data and literature from Iteration 1. Leading into Iteration 2 (with changes from Iteration 1 indicated by italics), these principles were:

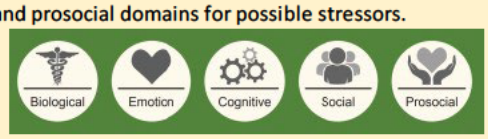
- Establish and maintain *professional* relationships *and relationships with the learning material within the context;*
- *Establish the 'why', personalise the 'what' and 'how', and negotiate the best 'when' and 'where' for PL within the boundaries of the context;*
- *Intentionally* apply new learning often and across contexts; and
- Engage in *formal* feedback with others.

Professional Learning

PL for Iteration 2 occurred 11 weeks after Iteration 1 PL and all participants were invited to attend. The venue for the one hour after school session was once again the school library and participants sat in groups of four to six around four large tables. Their request for self-regulation strategies was the focus topic. Participants were curious to learn how others in high stress environments managed their stress; in particular, members of the Emergency Services. They were also curious to learn environmental strategies that supported self-regulation, as well as personal strategies for self-regulation and co-regulation using Self-Reg theory (Shanker, 2013; Shanker, 2020). To meet these learning requests, I shared the Emergency Services intervention system *International Critical Incident Stress Management (CISM),* a system that provided organised, scheduled support for its members after work-related trauma incidents. Then we turned our attention to discussing and comparing self-regulation and co-regulation across Shanker's 5 steps of Self-Reg (2013). Figure 24 depicts the slide I used during PL to support this.

Figure 24

Comparing Self-Regulation and Co-regulation Across 5 Steps of Self-Reg

	Self-regulation	Co-regulation
Reframe	**Why this behaviour? Why now?** Look to *reframe* as *stress* behaviour and pause to consider a response that can add to the calm not the chaos 	
Recognise	Scan across the biological, emotion, cognitive, social and prosocial domains for possible stressors. Consider hidden and overt stressors Trauma 	
Reduce	Triage the stressors. What strategy can you put in place to begin to reduce the stress? Apply it.	What action can you take to assist the other person in reducing a stressor? "Tap out system"
Reflect	Reflect on what situations trigger stress responses in you. What signs do you get? What strategies can you put in place ahead of time to reduce this stress?	Talk to the person to help them understand their triggers, signs, and proactive strategies.
Respond	What are some (quick and longer) restoration strategies that work for you at work and home?	Support others in developing a bank of restorative practices that work for them, and provide support to them in applying these

The session concluded by sharing additional resources.

Findings From PL

The PL session provided an opportunity for sharing and discussion. Participants voiced their concerns about the inconsistent support they received from their employer, shared strategies for personal self-regulation, and considered ways they could coregulate with each other. When they learned about the organised systems employed by the emergency services, participants revealed the daily stressors they faced and the haphazard debriefing that occurred. Examples they gave included talking to other staff; occasionally talking to senior administrators (although they acknowledged that these people were also over-stressed); and, sometimes just retreating and not talking to anyone. Comments suggested the need for regular counsellor supports to debrief, followed immediately by the challenges of funding counselling support services. The view shared by participants indicated their belief that outsiders to the school and the Department of Education had no idea about the relentless stressors they experienced or how poorly they were supported.

The topics of self-regulation and co-regulation were workshopped in table groups. Participants shared their personal strategies for self-regulation, noting the differences, similarities, and changes in their own strategies. Participants then discussed co-regulation. They considered the signs they saw in others to indicate that co-regulation was needed. The system of tapping out was also discussed. This allowed a dysregulated teacher to be able to switch out of a space to regroup whilst another staff member stepped in.

Video Learning Conversations

Seven participants chose to be videoed in Iteration 2 and four followed up with VLCs the next day. The remaining three participants had access to view their video on the TORSH Talent platform asynchronously; however, were unable to take part in a VLC due to conflicting commitments. I videoed participants teaching in their learning spaces for 30 minutes, two weeks after the PL session. VLCs enabled me to share evidence of participants' application of PL as well as address their questions, provide clarifications, and further personalise the learning through discussion.

In preparation for the learning conversations, I previewed the video footage and preselected examples of self-regulation linked to the PL on self-regulation strategies. In contrast to Iteration 1, this process was not completed manually with pen and paper, instead, the TORSH Talent platform was activated. This platform allowed video footage to be uploaded, viewed, and annotated by viewers, both asynchronously (if viewing separately) or synchronously (if viewing together in person). The platform allowed for the annotations to align exactly with the video footage segments, streamlining this process significantly.

Four learning conversations took place after videoing occurred. Three participants were unable to meet on this day for various reasons. One participant (who worked part-time) nominated to discontinue participation due to scheduling challenges. The other two were unavailable; however, these participants were able to have their learning conversations as part of Iteration 3. Each conversation began with a familiarisation of the TORSH Talent platform to show its capacities and how it could enable reflection and dialogue beyond the learning conversation. Navigation to exemplars and correlating comments was quick and easy in comparison to the iteration 1 VLC experience. Participants responded directly onto the platform and their comments were easily distinguishable from mine as they appeared in a different colour.

Four VLCs were held in the days following videoing. Isabel and Larissa were familiar with the VLC experience due to their involvement in iteration 1, whilst for Mike and Beth, this was new. The format of the conversation included:

- an invitation for the participant to share how their self-regulation learning and application was going;
- familiarisation with the TORSH Talent platform;
- review of the video to connect practice to PL; and,
- asking the participant if they were willing to share their video footage with others.

Findings From Isabel's VLC

Isabel had participated in all elements of the research to this point. To begin our conversation, I invited to her to share her understanding of the Self-Reg process.

She disclosed this was still a process that she was unsure about. She didn't think she was using self-regulation in the moments when she was needing it most but acknowledged a general increase in awareness and ability to identify biological stressors.

Isabel reflected on the high stress levels she had experienced at the beginning of the year, confirming, "I am in a better head space than last time I spoke to you." She reported that these stressors had stemmed from a distorted perception of the school's initial expectations that she experienced as "being pushed on [her]," and that "perhaps they weren't as much as [she] thought." She saw her class as "really good, apart from a few key players." She noted that it was easier with only one or two whom she could put lots of energy into, better than "five, six, or seven." Other stressors noted by Isabel included: changes in routine; unexpected upregulation from activities meant to down regulate (an online yoga example was given); her own choice of clothing that sometimes restricted her movement; and the ongoing frequency and intensity of student dysregulation.

Isabel shared a success story of supporting a student (the one that she had referred to as impacting her stress levels earlier in the year). This story shared the student's progress in managing his stressors by taking up the offer to have a sleep when he got to school if that was needed. This short-circuited the routine of "meltdown – then sleep" that had been occurring; by accepting the offer to sleep, the melt-down and subsequent class evacuation and support from administration was avoided. Isabel reported, "He noticed *himself* the other day that he needed sleep, so for the first time he said, "[Miss Isabel], can I please have a sleep?" Yes!" and she continued, "He did, just took himself away, 40 minutes, done. So that was a real win." This example highlighted how supporting students with their own self-regulation through co-regulation was an important way to for Isabel to manage her own stressors.

Restoration was another topic we discussed. We looked at the Self-Reg definition of restorative as being an action or activity that reduced stressors across all five domains. Isabel considered times within her day that were restorative, and we discussed how laughter could be an example of this.

Strategies supported Isabel's self-regulation. Examples of these included older students leading daily physical education and Isabel using her voice in a non-threatening way to de-escalate students. Strategies supporting students (like a bucket of Self-Reg tools, spaces to retreat to, the option to restore through sleep) all connected to Isabel's self-regulation and management of stress. Other strategies referred to by Isabel were:

- "putting energy into key players";
- reducing stressors by informing students of changes;
- student leadership roles;
- individual approaches to suit specific students;
- "pre-warning" of upcoming expectations; and,
- relocating students.

Self-Reg theory was linked to practice through the annotation features of the TORSH platform. Isabel and I annotated examples from the video footage and connected them to the 5 steps of Self-Reg. She reiterated how she valued the video and VLCs and their affordances for reconnection to the PL, stating, "I think this is a lot more valuable because I can go on PL and understand it and then two weeks later I go, Huh? I need to refresh my memory." Connecting theory to practice in this way allowed her to regularly consider and apply her learning.

Findings From Larissa's VLC

This VLC evidenced Larissa's growing understanding of Self-Reg and provided an opportunity to further extend this. She described how she viewed situations differently as a result of the various PL opportunities she engaged in, and gave examples of the new questions she asked herself in dysregulated moments: "What do I need to do now to diffuse the situation or to calm the student" and "Why is the student like that?" She described a changed mindset of not taking student behaviour personally. Her learning also resulted in a greater awareness of what was happening with her energy throughout the day. Larissa credited multiple sources for her growth in understanding, recognising her learning outside the school, her own personal strategies, as well as the PL occurring within the school, this research included.

Larissa's VLC further personalised her learning. Using her video footage, we were able to connect Self-Reg theory to what occurred in practice for both Larissa and her students. She asked questions about the difference between the 5 steps and the 5 domains of stress, and I was able to provide clarification. She explained, "To use [PL], you need to have lots of tries at it," adding, "I think I need someone else to kind of say, right, okay, let's think about this. Whereas if it's just left to me, well then I'm thinking about too many other things." This conversation provided the opportunity to have multiple experiences of applying her PL, as well as the social element of someone else prompting her to "think about this."

The three video segments I preselected for the conversation highlighted various strategies Larissa used to self-regulate and manage her stressors as she taught. The first segment captured how Larissa used two older students in her Art class as co-regulators. She indicated the need to "keep [the younger students] contained" and how the two older students helped with this. She also noted support when the chaplain visited, adding an additional adult co-regulator for her and her students.

The second segment highlighted Larissa's slow and deliberate welcoming of students to the Art room. She met each student at the door, connected with each of them, and then directed them one by one to the place where they would sit. She acknowledged how this helped reduce her stressors at the same time as building relationships and supporting their focus during her class.

The third video segment showed a student who arrived at class showing significant dysregulation due to the noise of the other students in the space. She was crying and holding her hands to her ears not wanting to enter the room. Larissa and I discussed how noise can be a biological stressor for some people. Upon reflection, Larissa considered noise as something that only caused her stress if it stemmed from disengaged students.

The VLC focused on *strategies* for self-regulation to connect it to the PL for Iteration 2. In addition to using older students as coregulators, staggering the class entry with opportunities to build relationships, and considering biological stressors, Larissa used other strategies to reduce her own stressors. She shared how one-on-one

instruction supported dysregulated students noting “working with those kids one-on-one, it’s really rewarding.” She also noted that being organised for the lesson by having systems and rotations ready and seeking to mitigate potential stressors were effective strategies supporting everyone’s stress management.

Additional personalisation of learning occurred throughout Larissa’s conversation with a variety of other topics being clarified and discussed. These included:

- clarification of Self-Reg terms (domains, steps);
- considering restorative moments within a lesson;
- considering energy burning activities that invigorate versus energy burning activities that deplete;
- the potential for things that are invigorating to quickly turn to being depleting; and,
- how a biological stressor for a student, like needing to go to the toilet during the class, can be a prosocial, social, and cognitive stressor for the teacher.

In summary, Larissa’s conversation demonstrated the complex intersectionality of energy and tension that she and her students experienced and the various strategies that led to managing these. Larissa was eager to share her video footage with others (and view other participants’ videos) to support further learning.

Findings From Mike’s VLC

Feedback (DP4) was the driver for Mike’s involvement in the video intervention. He reported feeling like he was “treading water” and named various stressors to justify this feeling. He was aware of the way work stressors affected him beyond his workday and shared strategies he found effective in reducing these. The VLC allowed for Self-Reg theory to be connected to Mike’s practice and the themes of adult co-regulation, laughter, student relationships, voice, and routine supported further understanding of the 5 steps and the 5 domains of stress.

Mike described various stressors he was experiencing at school and their effects beyond the workday. He described being yelled at by students, needing to de-escalate students who were dysregulated, dealing with issues from the playground, hosting students relocated from other classes, pre-empting changes to routines and

particular students who demanded “a lot of attention.” A strategy he shared to reduce stress was stopping the whole class “when five kids were cycloning across the classroom,” although this resulted in prosocial stress as he felt guilty for interrupting students who were on task. He felt depleted after work resulting in a lack of motivation to do anything. Podcasts were proving to be a successful strategy (at the time) for Mike to restore energy after work.

Co-regulation from other adults was something that Mike was missing. In previous years, he had enjoyed teacher assistant time as it allowed him to “debrief and have a laugh” with another adult. He explained his predicament this year with a reduction in teacher assistant time and the timetabling of teacher assistant time during assembly when he didn’t need it. Mike missed the human interaction that helped to reduce his stress.

Laughter was also a factor that Mike considered as he described his relationship with students. He shared how he joked with students and how laughter helped coregulate students. He was also aware of times where poorly timed jokes added to further student dysregulation and admitted that care needed to be taken to avoid this.

One of the highlighted sections of the video showed the way Mike’s voice contributed to the calm of the learning environment. Mike acknowledged his naturally loud voice and that students often thought he was yelling. He was actively working on softening his tone. The conversation also allowed us to discuss the distorted perception of a dysregulated student. This student would be primed to perceive threat in facial expressions, body language, tone, movements, perceiving these as threatening even if they were not. Mike was able reframe the behaviour of a student in a heightened state, recognising their limited capacity to access their prefrontal cortex, the thinking, reasoning, and problem-solving part of the brain.

Routine and predictability were critical features of Mike’s stress-reducing teaching practice. He named it as a key part of his day and further explained, “If routine is broken, I need to be aware and name it up to students, otherwise, I’ve got a lot of kids who will lose it.” He continued, “they don’t like surprises.” Reflecting further, Mike noted that if other students were out of control in the classroom, many

students were not dysregulated by this, for them it felt normal. For him, it was very dysregulating to be in this situation. A change in routine, however, had a big impact on the class.

Throughout these conversations, Mike and I discussed the 5 steps: reframe, recognise, reduce, reflect, and respond. Mike recognised the cycle of "reflect and reduce" that was consistent in his practice. He admitted that he was not so good at recognising stressors in the moment; it was only in hindsight through reflection of triggers or situations that he was able to see what was going on. I used the video to demonstrate the ways that Mike was reducing stressors in the 5 domains. Examples of this included: sharing how he reduced biological stressors for himself by decluttering a learning space and having his water bottle handy, and for students, reminding them to remove their jackets as it was warm in the room; and how he reduced social stressors for an easily dysregulated student by explaining my presence when I was in there videoing.

Our conversation concluded with a success story from Mike. A student, who in previous years had shown frequent dysregulation, was flourishing in Mike's class. This student wore a hearing aid. During my classroom visits the previous year, I observed this student with another teacher and saw how various stressors were manifesting in dysregulated behaviours. These behaviours were not apparent in Mike's class. This student had a trusting and joyful relationship with Mike. He showed strong engagement in class. We considered how the lower frequency and louder nature of Mike's voice might be contributing to reduced stressors for this student, resulting in more regulated behaviour.

Findings From Beth's VLC

Beth chose to join the video group for the second iteration. She shared that her stressors in the classroom the previous term were too great and declared, "my response was *flight.*" Beth expressed her reluctance to be videoed, "there's always something about watching yourself on video; I can't say I enjoy it very much." Although Beth made early comments about the stressors of seeing herself on video, over the course of the conversation, her perception of the affordances of being videoed and the one-on-one VLC became evident. Upon reflection she confirmed, "I

actually enjoyed watching [the video]. I didn't think I would. I did. It's made me rethink a few things, which if ever I'm feeling like I'm not coping, just watching it again would sort of help that." When reflecting upon the understanding and application of PL, Beth shared the additional value that came from viewing her video and our subsequent conversation. She stated, "I must admit, [the PL] is making more sense than when I just sat through it. It wasn't until I watched myself, that I actually realised that I was doing some of these things, and more now that you've pointed things out as well."

I invited Beth to share her self-regulation learning progress and any shifts this created in her own management of stressors. Her response, "it varies depending on the children's behaviour," was further clarified as she described one of her students. Beth described him as a significant source of stress for her the previous term, sharing, "it was out of this world what he was doing on a daily basis and with an attendance of only 32%." She explained that this student was experiencing significant stressors in his life outside of school and these led to his relocation to live with his grandparents. Beth reflected "how just changing the social structure at home and having the care, the love, attention, fed, clothed, all of life's necessities, has made a major impact to even his attitude about learning." She continued by explaining, "it is magical. It's like having a new child in the class. I could never have imagined that there would have been that much change. It's incredible, the change," and "he's been here every day. He hasn't missed a day. So major, major change."

Beth experienced this change in behaviour as stress reducing for her; however, through our conversation, I was also able to help Beth reframe this child's previous behaviour as stress behaviour, not misbehaviour, and demonstrate how by reducing stressors across the 5 domains, he had experienced this transformation. By considering students' behaviours as stress-based rather than misbehaviour, Beth was able to support her learners with compassion rather than punish for misbehaviour, thereby reducing their stressors, and subsequently her own.

This scenario was also used to consider another student in the class whose behaviours could be reframed in the same way. This student was moved into foster care when her father was incarcerated. Beth saw a similar shift in her behaviour at school. She reported that the student, who often "did not make it past lunch time,"

before being sent home for “absolutely demolish[ing the classroom]” showed the same transformation in behaviour after going into foster care,

> She had her hair done. She had clothes. She had all of those things. She had food, a new school bag. She had everything. And her behaviour went from being what it was, to quite settled, with just occasional days when she [didn’t] cope.

Examples of stressors that Beth experienced were evidenced throughout the conversation. There were three examples of temporary stress, six of accumulated stress, five of positive stress, and nine of negative stress. These stressors were across all domains and resulted in Beth crying twice during the conversation stating, “It’s really hard when you feel the stress for them, but then you get to the stage where you just can’t do it anymore, and even though you want to have that empathy…. I’m really sorry.” This emotional stress resulted from stressors across other domains that Beth revealed during the conversation, for example:

- Biological stressors: dysregulated students, locked doors in the building;
- Cognitive stressors: Meeting the diverse needs of the students, disruptions to classes (phone calls, announcements over the intercom, students banging on the door and swearing);
- Social domain: dysregulated student behaviour and how it exacerbated other’s dysregulation, students not following instructions; and,
- Prosocial stress: described below.

Prosocial stressors were the largest source of stress for Beth. She described the empathy she had for students who were not living with their parents, had a parent in jail, were falling behind due to low attendance, were constantly seeking a safe adult, were constantly moving house, or being ignored by their peers. There was also worry about who was getting her attention and who was not, lessons that failed, important announcements over the intercom missed, reports from other teachers on the poor behaviour of her students, and her own dysregulation resulting in raising her voice at her students.

The VLC allowed for some of the PL concepts to be reviewed, re-explained, or reflected upon. For Beth, this included direct teaching about the stressors in the 5

domains through clarification of the difference between the social and prosocial domains. I used examples of Step 1 (Reframe), and Step 4 (Reflect) directly from her practice, to support Beth to shift her discourse. Beth described a scenario referring to students as "bad." Due to the safe learning space we had created for our VLC, I was able to invite Beth to shift her language to reflect her learning by stating, "I'm going to reframe your language there, [the students] that *experience stressors*…" Beth then reworded her sentence and continued on.

At the conclusion of our conversation, I asked Beth if she would consider sharing segments of her video with others. Her response was, "well, I walked in here feeling no, I wouldn't, but now, I feel like some of the things on there may be useful, and I'd also be keen to have a look at others." Not only was Beth willing to share her video, but she showed a growing curiosity to see others' practice and learning.

Group Discussion and Questionnaire

Similar to Iteration 1, a group discussion (recorded and later transcribed) and a questionnaire concluded the data collection for Iteration 2. This occurred on June 20th 2019, during a regular Thursday after school staff meeting. Seventeen participants arrived at the library after students were dismissed. Four tables were once again grouped to accommodate four to six people, and food and stationery were supplied.

The group discussion centred on the experiences of six of the video participants present at the meeting. They shared fears, vulnerabilities, student responses and behaviours, and their increased self-awareness resulting from viewing themselves teach. Interspersed in this discussion, I explained how the TORSH Talent platform supported the VLC process.

The purpose of the questionnaire was to collect information about how participants developed and applied self-regulation knowledge and skills and how this influenced their management of stress. Questions prompted participants to consider where, with whom, how often, and when they were intentionally applying self-regulation skills to manage stress. It captured their understanding of the 5 steps of Self-Reg and invited a description of if/how the PL changed their thinking, actions, and understanding and management of their own stressors. The questionnaire concluded

with an opportunity for participants to make suggestions for the content and mode of the next iteration of PL.

Findings from Group Discussion

Notable findings from the group discussion stemmed from two data sources. The first source came from my personal observations of energy and tension within the PL environment - the atmosphere in the room. Energy and tension shifts within the participant group were observable and strongly connected to food and laughter. The second data source was the group discussion transcript. This captured video participants sharing their experiences of being videoed and their subsequent VLCs supported by the TORSH Talent platform with the broader group.

Participants appeared depleted from their day as they arrived. Many immediately commented on the food, “It’s Marie, yay there is food,” and “Oh I forgot you were coming, and I am so glad you’re here, [because] I’m starving, didn’t have time to eat lunch.” There was a small yet notable shift in energy during this transition from teaching mode into learning mode. Within this transition, many participants engaged with each other, and laughter provided some release as they shared stories of the day’s challenges. Food also gave me a way to connect with participants; by providing food (noted in previous sessions as their favourite), they felt noticed and cared for by me.

Six video participants were the main contributors to the 15-minute discussion. They shared the affordances of viewing their own practice and reported a deeper awareness of how and when they self-regulated. They shared how video enabled them to view their relationships with their students. Christine, who was unable to participate in a VLC; yet accessed and viewed her video on TORSH, shared how a review of her video allowed her to notice the calm effect of leading students in a guided relaxation activity and how it supported her own regulation. Mike revealed how reviewing his video provided an opportunity to reflect on his relationships with students, particularly those who were easily dysregulated. Beth described to others how she was excited to see video footage of her class with a different teacher. Larissa commented that the video had allowed her to see moments during the class when she was able to briefly rechange, increasing her self-awareness of these opportunities.

Group laughter erupted on four occasions in the discussion as participants shared experiences. This laughter occurred when a potentially dangerous situation arose (an angry parent threatening to assault the principal; a dysregulated student sitting atop two stools; a student missing from class) or explaining someone else's discomfort (a student avoiding being filmed). This laughter appeared to relieve some of the tension these moments created.

Affordances of the TORSH Talent platform were shared throughout the discussion. This platform served as a repository for the videos and annotations. It enabled multiple viewings for participants, and through their annotations, it also provided further insight into their thinking, providing an additional layer of insight for me as the researcher. An example of this was shared with the group by Christine. She described I how TORSH allowed her to share her thoughts, feelings, and concerns at various times in the video. I explained how this created greater context and information for me as the researcher, extending beyond what I was able to observe and providing insights into what Christine was thinking.

Findings from Questionnaire 2

Directly after the group discussion, participants were presented with the questionnaire signaling the end of Iteration 2. Seventeen participants completed this questionnaire and my analysis of responses drew five themes from the data with broad implications for this research. The first theme centred on *how* participants were learning self-regulation and the "messy" process this was. The second theme exposed how embodied application of Self-Reg learning (through raised awareness) superseded participants' ability to articulate Self-Reg theory (Shanker, 2013; 2020). The third and fourth themes were around what enabled and constrained participants' application of self-regulation knowledge and skills. This final theme, drawn from data analysis, demonstrated that all the participants completing the survey were perceiving growth and change in their understanding and application of self-regulation. The last part of the questionnaire invited participants to describe their learning needs and curiosities as we moved towards Iteration 3 in our exploration of self-regulation together. These themes are explained in the following sections.

Q2 Theme 1: The Messy Process of Self-Regulation PL

Participant responses indicated many sources of self-regulation PL. Their learning was not isolated to the Self-Reg intervention within this project, rather it occurred alongside other modes of learning. School-based modes were reported through various school-based opportunities (VLCs) and workshops (Self-Reg (Shanker, 2013), Neurosequential model (Perry, 2009), the Zones of Regulation program (Kuypers & Winner, 2011)). Modes of self-regulation learning reported by participants as occurring outside of school included yoga, meditation, and support from health care professionals. Every participant experienced their own unique combination of complementary PL making the learning process a messy, non-linear one.

The participants' fidelity to any one approach or understanding of self-regulation did not occur with these multimodal PL experiences. Some participants privileged the language and ideas in the Zones of Regulation program, whilst others used the science within Self-Reg theory and the Neurosequential Model as a foundation for their growing understanding and shift in their practice. One maintained that her greatest source of learning was outside of the work context, through her own healthcare professional. Participants' diverse and varied knowledge and the complementary nature of multiple learning modes enabled them to make connections between the different content and views expressed within the self-regulation learning. This broadened participants' learning and created multiple entry points and angles for discussion.

Q2 Theme 2: Declarative Versus Embodied Knowledge

The intervention for this research was informed by Self-Reg theory. It provided the foundation for each of the PL workshops I facilitated. I invited participants to share their growing understanding of this process in the questionnaire. Some participants broadly described the process, for example: "A method/process of responding to stress related situations," "Understanding where the behaviour stems from," and "Understand methods to deal with stress." Others specified parts of the process that were especially important: "The most important is identifying the trigger/behaviour and reframing it, rather than see it as an annoyance," and "Steps 2,3,4, these steps seemed relevant to me when watching my video. Step 5 – I need to respond with

strategies more. Reframe doesn't happen for me." For some, explaining Self-Reg was challenging, "I understand but I can't put it into words," and "I am able to slightly talk about it but I don't feel confident." These responses showed patchy declarative knowledge of Self-Reg where terminology caused confusion for some; yet, when asked to share examples of their application of Self-Reg, participants shared their embodied knowledge and a deeper applied understanding.

My interpretation of the data found examples of embodied knowledge, the second significant theme from the questionnaire. Participants described their growing awareness and application of Self-Reg. One commented, "I am more aware of things that stress me within the classroom and how I react to students so I don't cause them stress." Similarly, another reported, "I am recognising my own stressors better than before when I didn't realise." Participants revealed "thinking and talking differently," suggesting that their learning had changed their perceptions and actions. One commented on being, "so much calmer in classroom disruptions." Participants were developing *interoception* described by Porges (2017) as "a process describing both conscious feelings and unconscious monitoring of bodily processes by the nervous system" (p. 15) when stress was present; then, either in the moment or through reflection, they were using this understanding to see the situation differently therefore respond differently.

Q2 Theme 3: Factors Enabling Application

The questionnaire prompted participants to consider factors that enabled or constrained their application of self-regulation knowledge and skills. A diversity of enabling factors were reported. One was social engagement. One participant reported how "talking to the children about why we need to self-regulate" supported application. Other examples included informal conversations with colleagues to share ideas and collect suggestions for alternate approaches, listening to success stories and what others were experimenting with, trialing or developing ideas, and asking for and giving feedback.

The opportunity to observe self-regulation in action was also cited as an enabler. Participants were *seeing it* in themselves and others by using their learning as a lens. One participant commented that "watching the development of children who

were learning to self-regulate," had helped their own application. The benefits of self-observation made possible through video were articulated by video participants stating, "Video gave great insight showing me the things that were happening I didn't even realise I did," and "Watching the videos of myself teaching and being shown how to create moments to reenergise and self-regulate," supported application.

Resources, personal practices, time, and reflection were also referenced as enablers. Participants independently researched on the internet, read literature and books, and viewed YouTube clips. Resources provided through PL were cited as supporting application. Yoga and relaxation were helpful, and just having the time to process and apply new learning was an enabler. One participant commented, "reflecting on how my students respond to different ways that I respond to stress," provided insight into factors that were helpful in applying learning.

Q2 Theme 4: Factors Constraining Application

Factors constraining the application of self-regulation were noted by all but one participant. This participant reported, "Luckily I am finding it OK to apply what I am learning as I am interested in it and enjoying seeing the impact Self-Reg is having on the students." The leading factor that constrained application was intense stress from student dysregulation. Comments included:

- "when there are more than two students losing control of their own regulation simultaneously";
- "going from one intense situation to the next without having down time";
- "when students have gone past the regulation stage and they become a danger"; and,
- "when kids are so heightened that they are unable to apply Self-Reg in the general classroom, which in turn affects others and raises my stress levels."

The constraints of time were reported seven times. Within these seven occurrences, different concepts of time were referenced. Some participants referred to lack of time, while another suggested that there were certain times of the year that were more difficult than others. One participant shared how, "reacting to the moment rather than taking/having time to stop and reflect" made it difficult to apply learning. Similarly, another commented, "I need to try as hard as I can to find a moment [to

self-regulate] – this is sometimes very challenging when other people need/rely on me."

Multiple demands also interfered with the participants' application of self-regulation. On five occasions participants shared examples of these including: "Day to day demands," feeling stressed due to high expectations, pressures, and responsibilities like report writing. One participant shared difficulty applying self-regulation learning when "in the middle of a lesson, when there are things going on everywhere, and there seems like there is no end in sight."

Additional themes of personal health challenges, empathy, and lack of social engagement were noted. The feeling of being "tired and run down," was reported by one. Another commented on the prosocial stress felt through empathy for others, describing how "it's hard not to become upset or frustrated when you are thinking about the rest of the class and their wellbeing." Two participants indicated the challenges of a lack of social engagement to support them. One commented that they had no "buddy class" and the other wanted a colleague with whom to discuss self-regulation with and share more examples of how to self-regulate.

Q2 Theme 5: Growth and Change

The intervention of Self-Reg as the PL for this research promoted growth in participants' understanding and application of self-regulation and change in what they noticed about themselves and others and the ways they responded. When applying self-regulation knowledge and skills in this iteration, participants referenced more places, more cohorts of people, and a greater frequency of application. They shared changes in their thinking and actions by referencing their past practices compared with their current practices.

In comparison to Iteration 1, participants reported applying self-regulation in a wider variety of locations, indicating six additional contexts outside of the school. With this came an increase in the cohorts reported; these now included grandparents, partners, and extended family as well as the parents of the school community. The frequency of application also increased.

Changes in thinking, action, and management of stress were also reported in the questionnaire. Participants thought differently about what they were seeing, and

this was a catalyst for changes in their actions. They identified how these changes supported their own stress management.

Participants' thinking changed. Reflection enabled one to "rethink strategies to use to avoid situations arising." Another described seeing behaviour differently and thinking about the "reasons behind the behaviour." Participants were thinking differently about themselves, their students, and their colleagues – recognising the stressors that resulted in low energy and high tension and subsequent dysregulation. Participants were allowing time for thinking before responding, as one described, "it has made me stop and think before action on what is happening around me." Another participant described the feeling of hope.

With changed thinking, came changed action. Unique examples were shared by participants as they described using their voice differently, adding wait time, and planning and structuring their classroom with "more thought in terms of self-regulation," and "more consideration of how students regulate or what they need to regulate." One participant shared information about a change in communication: "I now explicitly talk much more about managing one's stressors (to kids). This means that throughout the lesson if needed we are talking about managing stress and kids are much more adept at using the language." Participants explained how they were prioritising their own stress management, "I understand that I need to make time to reduce my own stresses and apply some of the strategies which were brainstormed in previous sessions. Ensuring I best prepare myself to deal with stress." Others stated how they "think about and do more things to help reduce stress," and "[try] to look out for [them]self more instead of just being a punching bag all day."

Participants applied the learning to support their own stress management. One reported this to be "massive for [them in their] current year." Many claimed that deepening awareness was a critical factor. Others shared improvement in recognising and responding to stressors, "I am able to identify when I need a break and what I need to do in order to be in a good head space," and "[I am] recognising my own stressors better than at times when didn't realise before." There was reference to using the 5 steps of Self-Reg, using "self-regulation strategies and recovery time

before going onto the next situation," and providing brain breaks for students and self.

Q2 Participant Requests and Concluding Comments

The concluding prompts of the questionnaire gave participants the opportunity to reflect on the learning so far and contribute ideas for content and mode of delivery for the next iteration's PL. Comments shared indicated how the learning was valued and appreciated: "This has been great so far," "Everything has been beneficial," and "Thanks so much for all you have done for us." Some suggestions for the next iteration were broad, for example: "More of what we have been doing" whilst others were more specific, including understanding the stressors associated with poverty. Requests included: "More practical hands-on Self-Reg for kids/adults;" "How to work with students who refuse to join in self-regulation;" and, "the role of pre-planning and being organised in lesson delivery." A strong theme emerged through the responses showing curiosity to engage with the video data. Participants asked for videos to be shared and opportunities to annotate and observe the strategies of others. A request to view videos from other schools was also made.

This theme of *applying* self-regulation learning through video continued when participants were asked *how* they wanted to learn. Watching, sharing, and annotating videos was suggested by five participants explicitly and supported by another who suggested, "continue as before, it has been great." Other requested modes included "direct instruction," "apps that are available for personal use in the classroom," and "more work on restorative practices," along with suggestions for yoga, breathing, or relaxation workshops.

Additional comments described ongoing challenges. One participant shared, "There are still a few on staff who don't recognise "trauma" etc. as a trigger of behaviour. They see students "playing" in senior staff offices as an easy out and still want punitive actions." Continuing from this comment another shared, "Building an understanding that if students are removed from classrooms as a way of regulating, it provides them time to teach," as well as a curiosity to further explore the "teacher role in building relationships after an event."

Implications for Iteration 3

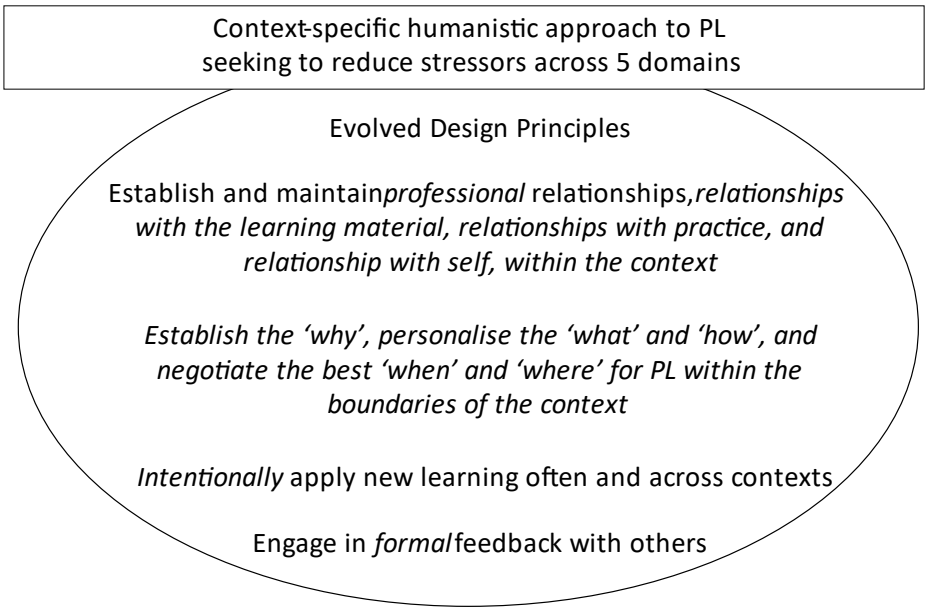
The conclusion of Iteration 2 signalled another critical point in the DBR process. Congruent with the transition between the first and second iterations, the shaping of Iteration 3 was pragmatic, scholarly, and reflexive. Additional implications for Iteration 3 included accommodating for significant staffing changes. These changes included the appointment of a new principal, creation of a new senior leadership role (that was taken up by an existing staff member), and commencement of three teachers to cover staff leaves. These changes impacted my own reflexivity as an educator, PL facilitator, and researcher, as I considered how to differentiate the PL for the new and continuing participants in the final iteration of this research.

Pragmatic decisions were made in collaboration with participants and school leaders present during Iteration 2. Together, we decided the mode and timing of PL would remain the same, whilst the content of the PL would change to meet participant needs and requests. There was growing curiosity for non-video participants to witness how self-regulation learning was applied by video participants and this theme of *application* of self-regulation was requested as the focus for PL content in Iteration 3. The three-part structure of the iteration remained the same following the familiar pattern of PL, video intervention, and questionnaire.

Data from Iterations 1 and 2 provided consistent evidence of context-specific, intense, and enduring stress experienced and expressed by participants across the five domains. My engagement with the literature on the brain/body response to stress deepened my understanding of the many ways significant stress leads to dysregulated behaviours, maladaptive coping strategies, social disengagement, and a reduced capacity to access the parts of the brain required for learning. To recognise and respond to participants' allostatic overload (McEwen, 1998) resulting from the intensely stressful nature of the context, I chose to nest all four principles within a humanistic approach and use the 5 domains to reduce stressors for participants where possible (see Figure 25).

Figure 25

Evolved Design Principles With Humanistic Approach



Chapter 5 Summary

This chapter included the findings from Iteration 2 of my research. I shared findings from the PL, VLCs, group discussion, and questionnaire and highlighted the messy nature of PL through multiple personalised approaches highlighted. There was evidence of the dissonance between declarative and embodied knowledge with changes in participants' thinking and actions demonstrating growth. Factors enabling and constraining application and the powerful combination of PL, video, and mentorship were also reported. Participants requested a focus on application of Self-Reg, specifically curious about viewing and annotating the video participants' practice and I applied a humanistic lens to the design principles moving into the final iteration.

The following chapter presents the findings for Iteration 3. The chapter shares the preparations I engaged in for the final iteration and the findings from the three research components. It concludes withthe sharing of results from the research in preparation for discussion.

Chapter 6: Iteration 3 Findings

Applying the Learning

This chapter describes the third and final iteration of the DBR phase of the study. This iteration occurred from July 22nd to October 24th, 2019. It coincided with the commencement of a new principal and three new teaching staff. To share what occurred in this iteration and the findings from each of the three research components the chapter has been divided into four parts:

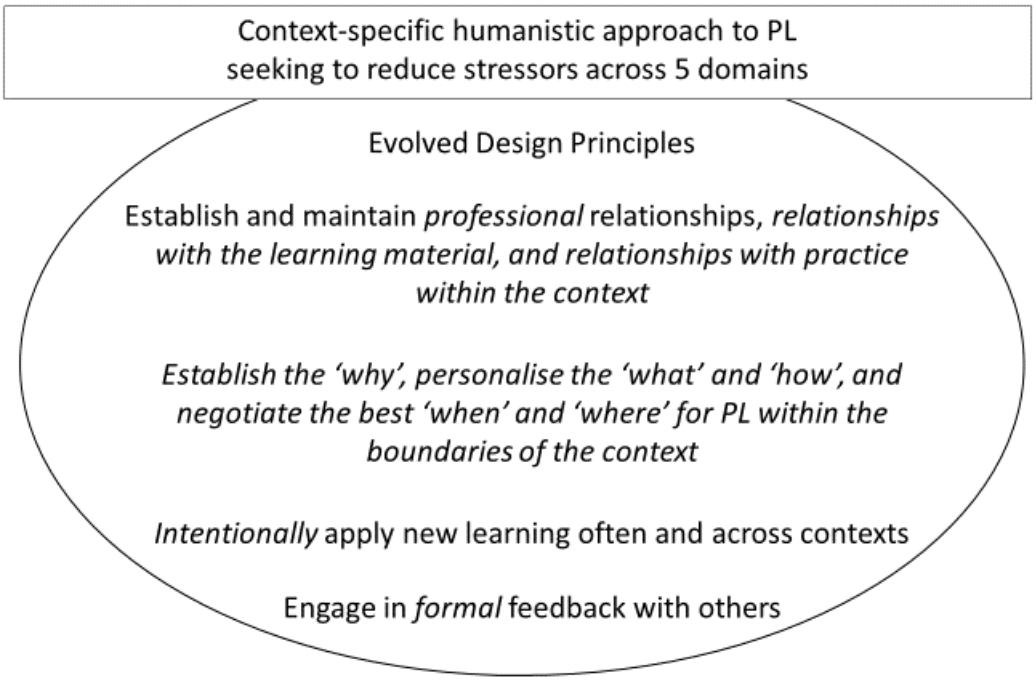
- Preparation for Iteration 3;
- Professional learning (PL);
- Video learning conversations (VLCs); and,
- Questionnaire.

Preparation for Iteration 3

My preparation for Iteration 3 was once again pragmatic, reflexive, and scholarly, as I sought to bring a humanistic approach to all aspects of the research in the final iteration. Humanism, described by Cohen as "an intrinsic set of deep-seated convictions about one's obligations towards others" (2007, p. 1029), prioritised the human needs of the participants within this challenging context. A participant with high energy and low tension would be well-positioned to engage fully in PL and enjoy the affordances of professional growth; conversely a participant with low energy and high tension, susceptible or already experiencing dysregulation, may have reduced capacity and desire to engage in PL. This research context demanded a unique and responsive approach to PL (Guskey, 1994) to acknowledge and accommodate the intense and ongoing stress participants experienced. Figure 25 from the previous chapter, depicted again at the end of this paragraph, shows the four evolved design principles from Iteration 2 that continued into Iteration 3 (with an addition to DP1+ of relationships with practice) nested within a humanistic approach that sought to reduce stressors across the 5 domains for participants.

Figure 25

Evolved Design Principles With Humanistic Approach



I prepared for the pragmatic aspects of the research in similar ways to the preceding iterations. I collaborated with senior administrators to schedule PL sessions, video day rosters, learning conversation release times, and communication with participants. The content of the PL was collaboratively shaped through engagement with participants in group discussions and through questionnaire responses at the end of Iteration 2. I booked, collected, and set up video equipment to ensure that participants could focus on time spent teaching rather than on the pragmatics of the research. I sought permission from video participants to share their videos with non-video participants as part of the focus on application for PL in Iteration 3, and once again, the invitation was extended to all participants to be part of the video component. Predictable patterns scaffolded Iteration 3 with many similarities to previous iterations, while differences in content, participation, and humanistic lens using the 5 domains to reduce stressors for the design principles were noted (see Table 10)

Table 10

Similarities and Differences Between Iterations 2 and 3

Research components	Similarities from Iteration 2 to 3	Differences from Iteration 2 to 3
Design Principles	Each DP was adapted to reflect Iteration 1 findings and engagement with literature. These were reworded (DP+)	The four DP+ (with an adjusted DP1++ to reflect relationships with practice) were nested in a context-specific humanistic approach to PL seeking to reduce stressors across the 5 domains
Professional Learning	PL sessions occurred after school on Thursday	PL in Iteration 2 focused on self-regulation *strategies*. *Application* of self-regulation was the focus in Iteration 3
	PL mode was a workshop	
Video Learning Conversations	Isabel, Lynda, and Larissa from Iterations 1 and 2 chose to continue; Mike from Iteration 2 also chose to continue	An additional video participant (Henry) joined and Christine who was videoed but unable to attend the VLC in Iteration 2, used the Iteration 3 time for this.
	TORSH Talent platform activated to use as a repository for videos and learning conversation annotations	TORSH Talent continued as the platform to store and annotate video for learning conversations
Questionnaire	12 participants responded to questionnaires in Iteration 2 and 3	Three participants responded to the Iteration 1 questionnaire, were absent for Iteration 2's questionnaire, then completed Iteration 3's questionnaire

Preparation for Iteration 3 also included my engagement with the literature. The literature on stress and brain/body response to it (Boyce & Ellis, 2005; McEwen, 2007; Selye, 1956, 1976a) deepened my understanding of what was happening on a psychophysiological level for participants within my research. Participants' experiences of and responses to stress varied (Porges, 2007; van der Kolk, 2014) and

had implications for their capacity to engage in PL. I planned PL for Iteration 3 with an intentional focus on reducing stressors across the 5 domains to soothe participants' limbic alarms (Shanker, 2020), reduce their allostatic load (McEwen, 1998) and enhance their capacity to use their prefrontal cortex (Perry, 2006; Shanker & Barker, 2016; Siegel, 2017). This humanistic lens provided the context for the evolved design principles.

Although the previous iterations already included some of these aspects, I was more deliberate in my application of the 5 domains to reduce stressors and heightened my awareness of participants' energy and tension to increase their capacity to engage in PL opportunities. I considered each domain individually and each participant individually. My relationship with some was well established, while for those new to the school, it was just beginning.

In the biological domain, food and seating were considered in previous iterations. In Iteration 3, lighting and temperature within the learning space as well as opportunities for physical movement within the session were added considerations. I included specific food, using previous knowledge of what participants liked, as well as foods that brought out a playful side in participants (assorted chocolates) helping to reduce tension through laughter and social engagement as they transitioned from their day of teaching to PL. From previous iterations, the emotion domain was supported by social engagement, laughter, and time to complete an energy and tension snapshot. To reduce stressors in the cognitive domain, I organised hands-on review materials, kept routines the same, and used the annotation feature of TORSH to connect theory to practice and personalise learning for participants. Opportunities to engage socially through group tasks supported the social domain and included collaborative reviewing of material, shared experiences (including collaborative video annotation), and problem solving. The prosocial domain was addressed through reframing participants' (and students') stress-based behaviours, shared experiences that invited empathy, and use of participants' videos to support learning and connections between participants.

Preparation for Iteration 3 also included creating the final questionnaire. The first section of the questionnaire was similar to the questionnaires in Iteration 1 and 2

as I sought to capture participants' learning and application of self-regulation across their various levels of engagement with research elements. The final section of the Iteration 3 questionnaire collected data about the importance participants placed on a diverse assortment of PL elements (for example, relationships with presenters, the physical space, timing of PL, feedback, food, and more). I merged relevant data from this part of the questionnaire to support my PL findings below.

The school's context required an approach to PL that understood the excessive stress participants were under and responded to it with a humanistic, whole person approach. This approach took into consideration and accommodated for the brain/body response to stress, providing an invitation to reframe behaviour, recognise and reduce stressors, as well as reflect and respond to support restoration of energy and tension. This resulted in my application of a humanistic Self-Reg approach across all aspects of PL in Iteration 3 to support participants' capacity to engage in their own Self-Reg PL.

Professional Learning

The final hour-long PL session was held in the library after school on Thursday, August 1st, 2019. There were 13 participants present due to a concurrent (mandatory for some teachers) PL session occurring. Participants had requested that PL focus on the application of self-regulation and included viewing video participants' footage to apply self-regulation learning. I used the 5 domains to recognise and reduce stressors for participants and support their adjustment of energy and tension to fully engage in the learning.

To begin the session, I shared how the research was reaching an international audience through recent conference presentations in Canada and England and delegates' interest in this research. I then explained the shift to a humanistic lens for the evolved design principles, and this was followed by two group tasks. The first group task was a Self-Reg sorting activity and the second was a video annotating activity.

Participants new to the school were grouped with those who had experienced the PL over the course of the research for the Self-Reg sorting activity. This created an opportunity for review and coaching for experienced participants and engagement in

new learning for new participants. I gave groups a selection of Self-Reg terms, concepts, and images to sort and participants created a display to share what they had learned.

The second group task involved video participants sharing their videos with a small group of colleagues to identify examples of Self-Reg for either teacher stress management (self-regulation) or student stress management (co-regulation). Participants also looked for evidence of reframing, recognising, and reducing stressors, reflecting to create stress awareness, and responding through restoration. This evidence was annotated by participants on the TORSH Talent platform. Each group had 20 minutes to complete this before they returned to the main group to share.

Findings from PL Supported by Questionnaire Responses

To report the findings from the PL, I took a different approach from the previous two iterations. In this iteration, findings from the PL at the beginning of Iteration 3 (with 13 participants) and the responses from the last section of the Iteration 3 questionnaire (completed by 15 participants) were combined as they informed each other and showed interesting trends. The majority of the questionnaire results will be shared later in this chapter.

While I used the 5 domains to reduce stressors for participants during the PL, I also drew from Iteration 3 questionnaire data to include participants' reflections on various domain-related aspects of PL (for example, relationships with facilitators (social), timing of PL (cognitive), opportunities for feedback (social/prosocial), opportunities to suggest content (cognitive), learning environment features (biological)). In the questionnaire, participants were asked to rate the importance of each aspect on a five-point continuum from *extremely important* to *unimportant*. They were also asked how often they had experienced this aspect within the Self-Reg PL using a five-point continuum from *always* to *never*. For some of these aspects, like 'opportunities to share practice,' participants were asked if the opportunity was provided and then asked whether or not they took up the opportunity, again responding on a five-point continuum from *always* to *never*. These data revealed participants' PL experiences and priorities. To share these findings, I describe the deliberate actions I took in each domain to reduce stressors for the final PL focusing

on the application of self-regulation followed by questionnaire data related to this domain.

Biological Domain

To reduce stressors in the biological domain during the PL, I deliberately addressed the sensory elements of the learning environment and participants' energy and tension needs (food and timing). In my deliberate efforts to reduce stressors in the library, I tidied, wiped down tables and chairs, grouped them to accommodate four to six people, aired the room, and adjusted the lighting (using the curtains to reduce sun glare). Participants placed a high importance on this in their responses on the questionnaire and indicated that this was achieved in our sessions (see Table 11).

Table 11

Biological Domain Factors of PL: Learning Environment

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
The temperature, lighting, acoustics of the learning environment	6	5	3	1	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
The learning environment was comfortable	7	8	0	0	0

One participant wrote that "being on site could sometimes be a stressor depending on how challenging the day was," suggesting the PL space as a potential source of stress.

Food also reduced stressors in the biological domain. PL sessions were scheduled at a time when participants frequently reported low energy and high tension. Food provided energy and often sparked laughter which served to reduce some tension. The questionnaire invited participants' views on the inclusion of food at PL. This featured in questionnaire responses as having varied importance, with one participant commenting, "It's always a bonus" (see Table 12).

Table 12

Biological Domain Factors of PL: Food

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Food included	5	3	4	2	1
Frequency of this occurring within the research?	Always	Mostly	Sometimes	Rarely	Never
Food was included	15	0	0	0	0

There were limited options for the timing of the PL as I needed to work within the school meeting schedule. This resulted in PL occurring at the end of the day towards the end of the week. Participant comments from the questionnaire included: "Time for staff meeting is not always the best time of day, but that's just the way it is," and "after school is the only time to run PD – not always the ideal time." PL within the school day was preferred, as one participant advocated, "having time off class to meet is fantastic." Table 13 depicts participant responses regarding their views on PL timing.

Table 13

Biological Domain Factors of PL: Time of the Day/Week

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
The timing (time of the day or week) of learning	6	6	3	0	0
Frequency of this occurring within the research?	Always	Mostly	Sometimes	Rarely	Never
The time of the learning suited my needs	3	8	3	1	0

Emotion Domain

Reducing stressors in the emotion domain was addressed by providing opportunities for participants to check in with their energy and tension and apply

strategies to prepare themselves to be in a state conducive for learning. This was done using the energy and tension snapshot (Appendix K). Table 14 shows the importance participants placed on this and their opportunities to do this within the research. It also includes whether they took advantage of these opportunities.

Table 14

Emotion Domain Factors of PL: Energy and Tension Check In

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
The opportunity to reflect on your own energy levels across domains prior to PL and apply strategies that could create a calm, alert state for learning	5	9	1	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
There were opportunities to reflect on my energy levels across domains prior to PL and apply strategies that could create a calm, alert state for learning	9	4	1	1	0
I took up these opportunities	5	6	3	0	1

These data show that participants considered checking in on their energy and tension as an important thing to do to prepare for learning. It also shows that these opportunities were provided, yet, not always taken up.

Cognitive Domain

A humanistic approach to the research supported the reduction of stressors across all the domains to increase the capacity of participants to engage cognitively with the PL. Within the cognitive domain, I sought to reduce stressors: I gave participants opportunities and reasons to establish and maintain a relationship with the learning material by having a strong reason to engage with it; and, I ensured material was personally and contextually relevant, effectively disseminated, appropriately paced, reflected upon, and revisited.

In the final PL session, I was challenged to meet the diverse needs of the participants. Some had been part of the learning since the beginning, whilst others were new to the learning or had missed sessions along the way. I scaffolded the group tasks to allow those with a deeper connection to the learning to coach those who were new or had missed parts as they worked together to make their display. The questionnaire helped to further understand the stressors associated with being a newcomer or an intermittent attendee of ongoing PL.

The importance of relevant and effective dissemination of knowledge and skills in PL was ranked highly by many participants (see Table 15).

Table 15

Cognitive Domain Factors of PL: Relevant and Effective Dissemination of Knowledge and Skills

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Ensuring relevant and effective dissemination of knowledge and skills	5	7	3	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
Dissemination of knowledge and skills was relevant and effective	5	7	2	1	0

Intermittent participation by one participant who indicated they *rarely* experienced this added, "[I] missed a lot of sessions so I didn't feel connected." It was unclear whether this lack of connection was with the material, with colleagues, or with the presenter.

I also reflected on the pacing and frequency of PL within the cognitive domain. Participants once again indicated varying degrees of importance and an overall view that the pacing met their cognitive needs (see Table 16).

Table 16

Cognitive Domain Factors of PL: Pacing and Frequency

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
The pacing and frequency of the PL/application cycles	3	9	3	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
The pacing and frequency of the PL/application cycles met my needs	7	5	1	1	0

Two additional comments mentioned pacing. One, made by a participant who indicated that the pacing and frequency *always* met their needs, noted that there were "not too many sessions per term." The participant who recorded that the pacing and frequency *rarely* met their needs shared that this was "not the presenter's fault, [rather] illness, family obligations occurred." Illness and family obligations were additional stressors from the social and prosocial domains that were noted here as disrupting the frequency of learning for this participant.

Providing opportunities to review information was another way stressors were reduced in the cognitive domain (see Table 17).

Table 17

Cognitive Domain Factors of PL: Review

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
The opportunity to revisit previous content	4	11	0	0	0
Frequency of this occurring within the research?	Always	Mostly	Sometimes	Rarely	Never
There were opportunities to review previous content	7	8	0	0	0

Review opportunities occurred through PL sessions, social engagement in group activities, and independently through personal reflection. The questionnaire provided further insight into the importance participants placed on opportunities for personal reflection on their learning, their experience of this being offered within the research, and their uptake of these opportunities. Table 18 shows the importance participants placed on personal reflection as part of PL, the frequency these opportunities were offered in this research, and their up-take of these opportunities.

Table 18

Cognitive Domain Factors of PL: Personal Reflection

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Opportunities for personal reflection on the learning	5	8	2	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
There were opportunities for personal reflection on the learning	8	4	3	0	0
I took up these opportunities	7	4	4	0	0

This set of data shows the high importance participants placed on reflecting on their learning and how, when these opportunities were offered in the research, participants took them.

Social Domain and Prosocial Domain

The social domain often appeared concurrently alongside the prosocial domain within the findings and are shared together in this section. Sometimes social domain activities (like engaging socially with others when sharing practice, receiving or giving feedback, participating (or not participating) in whole staff discussions, or mentorship opportunities) prompted prosocial domain responses (like empathy and connection, or the opposite, feelings of not belonging or not feeling understood).

The potential for social and prosocial stressors in the final PL session was higher than previous iterations. Some participants had pre-established relationships within the group (with both colleagues and me), while others were in their early weeks of establishing these. I recognised that new participants, participants who had missed previous PL sessions, and participants who had volunteered to share video

footage of their practice may all feel additional stressors in this session. To reduce these stressors, participants self-selected groups for the sorting and video annotation tasks. All groups were small (between two and five people) and allowed for social interaction and connection.

Mike, Larissa, Christine, and Isabel shared segments of their videos with their chosen colleagues and reported various experiences. Isabel reported feeling "not too excited about others watching" her teaching and Christine revealed feeling "initially nervous about doing this but felt it was important [she] showed staff how much [she] valued this process." This shared vulnerability sparked new insights for Larissa and Mike who commented, "It was great to be able to watch with a peer and have them pick up things I didn't notice," and "It was very helpful. Other colleagues were able to glean information/detect self-reg moments that I had missed. Also expanded our own toolbox with new strategies we can use."

Participants who viewed someone else's video shared the affordances of this practice in their questionnaire comments. They were able to apply Self-Reg knowledge and skills as they observed their colleague in action. This included identifying Self-Reg examples, making connections to their own practice, and observing strategies in action. The social nature of the learning connected colleagues with each other, allowing them to identify similarities and differences in practice, further enriching and extending the learning experience and fostering prosocial connections.

After 15 minutes, all participants reconvened to share their observations. Video sharing and the subsequent collegial conversations enacted Step 4 of the Self-Reg process: reflecting to create stress awareness. Participants noticed patterns; for example, 10 minutes prior to the end of class, stressors "generally ramped up for all." With raised awareness, opportunities to enact necessary changes to pre-empt stressors were possible. Collectively, participants considered strategies to reduce stressors based on their reflections.

I invited further reflection on other social and prosocial PL elements through the questionnaire. These included PL stemming from the sharing of practice, receiving feedback, whole staff discussions, and mentorships. The following tables show questionnaire data on these elements that brought further insights and questions.

Participants considered their relationships with colleagues as highly important (see Table 19) while the relationship with the presenter (see Table 20) was of lesser importance.

Table 19

Social and Prosocial Domain Factors of PL: Relationships With Colleagues

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Establishing and maintaining effective relationships with colleagues	8	6	1	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
I established and maintained effective relationships with colleagues	8	6	1	0	0

One participant commented that establishing and maintaining effective relationships with colleagues was “one of the most important parts of [their] job.”

Participants felt it was less important to establish and maintain a relationship with the presenter (see Table 20). One participant shared, “If I feel a connection with the presenter, I am more likely to want to understand and [be] comfortable to ask questions,” while another indicated their low attendance in sessions resulted in rarely feeling connected to the presenter.

Table 20

Social and Prosocial Domain Factors of PL: Relationship With Presenter

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Establishing and maintaining effective relationships with the presenter	4	2	7	2	0
Frequency of this occurring within the research?	Always	Mostly	Sometimes	Rarely	Never
I established and maintained effective relationships with the presenter	8	4	2	1	0

Participants shared the importance they placed on three PL elements: sharing practice, feedback, and whole staff discussions. They also reflected on whether opportunities to share, receive feedback, and discuss were available within the research, and their subsequent uptake of these opportunities. In the following three tables, what is interesting to note is the difference between the importance of and uptake of opportunities by participants.

In Table 21, participants indicated high importance for sharing practice in PL. These opportunities were provided, yet, less than half of the participants took up the opportunities to share.

Table 21

Social and Prosocial Domain Factors of PL: Sharing Practice

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Sharing of practice (examples) highlighting the application of learning	7	8	0	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
Examples of practice were shared highlighting the application of the learning	8	4	2	1	0
I took up these opportunities (1 participant did not indicate)	2	5	4	2	1

When considering feedback as an aspect of PL, the same pattern appeared. Again, participants indicated the high importance of this and perceived these opportunities to be provided; yet only some chose to take up the opportunities to receive feedback (particularly through VLC opportunities) (see Table 22).

Table 22

Social and Prosocial Domain Factors of PL: Feedback

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Opportunities for receiving feedback on the application of the learning	6	8	1	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
There were opportunities for receiving feedback	8	5	0	2	0
I took up these opportunities (2 participants did not indicate)	4	3	2	2	2

Participants reflected on whole of staff discussion in PL and the results showed the extreme importance (10 of the 15) participants placed on this, with the remainder regarding whole staff discussions as very important. Once again, participants indicated that although these opportunities were offered, they did not always take them up (see Table 23).

Table 23

Social and Prosocial Domain Factors of PL: Engaging in Whole Staff Discussions

How important is this factor in PL?	Extremely Important	Very Important	Somewhat Important	Not very important	Unimportant
Opportunities for whole staff discussion about the learning	10	5	0	0	0
Frequency of this occurring within the research?	**Always**	**Mostly**	**Sometimes**	**Rarely**	**Never**
There were opportunities for opportunities for whole staff discussion	10	2	2	0	1
I took up these opportunities	7	5	2	0	1

These PL and questionnaire findings prompted me to consider various aspects of PL across the 5 domains and the value participants placed on them. They demonstrated that some participants took up PL opportunities and others were less likely to. The findings gave insight into a mixed experience of PL and differences in application of that learning. Participants involved in both the cycles of PL sessions and the VLCs demonstrated strong growth in their Self-Reg knowledge and skills and were leaders within participant groups during the final PL session focusing on application. The findings in the following section give further evidence to this effective combination of PL, video, and mentorship through VLCs.

Video Learning Conversations

Larissa, Isabel, and Lynda continued their participation in the VLC component. Mike also continued in Iteration 3 (his second time) and Henry joined for the first time in this final iteration. Findings from these five VLCs are shared in the following section. Beth was on stress leave; Christine was not available to be videoed; however, her conversations focused on her perspective of the research project through her lens as a

school leader, and Harriet (whose part-time hours made availability a challenge) discontinued her video involvement. To summarise, five video participants and six learning conversations took place in this final iteration.

After videoing the five participants, I annotated evidence of self-regulation application in their practice. As in Iteration 2, participants were invited to access their footage and my annotations using the TORSH platform then add their own comments in preparation for our learning conversation. These conversations referenced examples of self-regulation from the video and invited reflections on the overall research experience. Due to an unexpected interruption, the learning conversations were delayed for seven weeks.

Findings From Isabel's VLC

Isabel volunteered to be videoed in all three iterations. As her third VLC unfolded, she shared her relief that students were "actually doing what they were supposed to" while I was filming. The conversation revealed growth in Isabel's understanding and application of Self-Reg, an increased awareness of the consequences of her own responses on her students, school structures she found helpful, and a new lens on restoration.

The language Isabel used also indicated growth in her understanding of Self-Reg. She reframed misbehaviour to stress behaviour through statements like, "Before I would be sympathetic to their home life, but still probably expected them to be able to do simple things or be able to do what they could do yesterday or last week," and "they are not *choosing* to act that way." She referred to the specific parts of the brain in her justifications for behaviour, showing her knowledge of the science behind the brain/body response to stress.

Isabel's practice included the application of Self-Reg PL. Video footage provided evidence of reframing, recognising, and reducing stressors for her students, and how that supported her own management of stress. Isabel noted the relationship between supporting students to self-regulate and her own stress management stating: "having him calm, makes me calm." She also shared her unique approach to each student and her growing capacity to be "more understanding, trying to move if I can, or give [the student] space or time." Her ability to recognise stress responses in her

colleagues also increased: “I’m actually good at seeing it in other teachers, as in, I can see when they’re stressed” but “I’m not as good at seeing it in myself until after.”

During Iteration 3, Isabel engaged in Step 4 of the Self-Reg process - reflection. Through reflection, she noticed how she applied some aspects of Self-Reg to herself and other aspects to her students. For example, Isabel shared that there was a greater likelihood of her applying the 5 domains of stress (considering her own biological, emotion, cognitive, social, and prosocial stressors) to herself, whereas she used the 5 Self-Reg steps (reframe, recognise, reduce, reflect, respond) with her students. She also realised how her responses to students resulted in either reducing or increasing their stress. She shared, “if things are starting to escalate in the classroom, it’s probably some of my doing,” adding, “I probably started that off.” Isabel also acknowledged, “I probably only reflect when things have gone bad,” and concluded that it was “mental exhaustion” stopping her from reflecting when things go well.

Some school structures and systems supported Isabel’s management of cognitive stressors. She reported that streamed mathematics classes helped her be more targeted with her planning. She suggested that this reduced stressors for teachers and students because it provided a break from the regular class community and reduced the teacher-student ratio. Isabel indicated that this supported everyone’s self-regulation. Extra adult support, such as teacher assistants and volunteers, was also reported by Isabel to be either a stress reliever or a stress enhancer, depending on the situation.

I identified moments of restoration taken by Isabel as she taught. When viewing the video footage, I drew Isabel’s attention to the ways she reframed, recognised, and reduced stressors for students, and we connected this to her experience of feeling calm in these moments. By recognising mini restoration moments within the school day, a shift in energy and tension was possible. Isabel noted, “yeah, I remember doing it just yesterday. In my writing group, I looked around and said, ‘Oh, everyone’s actually doing what they’re meant to be doing’.” Isabel’s increased awareness of these calming moments opened the possibility of reducing tension, promoting stress management in Iteration 3.

Findings From Larissa's VLC

Like Isabel, Larissa also engaged in all aspects of the research. During our conversation in the third iteration, she expressed the magnitude of distress experienced by staff in this context and her decision to leave the school. She advocated for structured support for teachers to debrief, shared the personal significance of the Self-Reg PL, and recognised the importance of co-regulation and restoration.

Larissa paused when asked to share what stood out for her at the end of all this learning, then responded:

> Yeah, well quite frankly in this context we need to do a lot of self-regulation and not even all the self-regulation in the world is keeping us under control at the moment. I think there's a lot of us who are very impacted, yeah, by kids in the classroom. And yeah, we're all in the negative rather than the positive.

When I prompted her for examples she commented, "Staff members crying every day is normal. Staff members saying that they hate their job, they hate working here. Kind of feel that they have no control over things." The intense stress of working in this context led to Larissa's decision to move to a different school.

Larissa's wellbeing was at the centre of her decision to leave. When asked if leaving was a self-regulation strategy she responded, "Without a doubt. To manage my wellbeing and that of my family as well. And I think I would probably give up teaching if I was working here next year. I don't think mentally I could keep going." Giving further context and insight into applying self-regulation in this context she reflected:

> So you can still kind of apply, even in most chaotic situations, so you can still try and sort of go, 'Okay, I'm going to try and just self-regulate myself so I don't completely burn out here.' Like in this second, while I've got 10 kids throwing chairs, and two kids running around on desks and whatever. But yeah, a lot of us I think have been affected too much by vicarious trauma.

This vicarious trauma led Larissa to explain a key piece she felt was missing for herself and for her colleagues. She explained how social workers received support to debrief and how teachers needed this too:

> School social workers have a boss that they report to. And they have to debrief like once a fortnight on their clients that they're seeing through the schools. And their boss makes sure, "Are you managing? What are you doing in order to look after yourself?" And I think teachers, we're going to need to have something like that, because a lot of us are just taking too much on and needing to act in ways like social workers, but we don't have any means of debriefing.

She shared that self-regulation, on its own in this context, was not enough. She further explained, “If you're really tired and burnt out, you sometimes can't even be bothered to self-regulate. You just kind of start crying.” A critical piece missing for Larissa, and a way to be supported through co-regulation, was the inclusion of a debriefing system.

Larissa valued the Self-Reg PL. As part of her recent teacher registration application, she was prompted to record impactful PL and she listed the PL associated with this research as the main one, stating, “Reframing the behaviour has been a new thing for me.” She considered how “lots of teachers who work in more middle-class schools that don't have that understanding, they probably still look at it as naughty behaviour, rather than trying to reframe it and understand [the stressors].” She added:

> Looking at that five-step model to see what I can do to reduce the stress and what's underlying it and that kind of thing. So, I think that's really, really important and I'll kind of just always keep on doing that.

Her comments demonstrated her understanding and described what enabled and constrained her application of the learning. She reported how extra adults during her lessons enabled her application of self-regulation and recognised that application was constrained “when there’s just too many children who are dysregulated in one room. And you just can’t, you’re overwhelmed.” Overwhelmed teachers are themselves dysregulated, unable to self-regulate, and therefore unable to coregulate dysregulated students, an example of a toxic stress cycle.

Larissa shared various challenges arising for students who had experienced trauma and ways she supported them. She noted their lack of organisation and

resilience. Reviewing the video together in Iteration 3, enabled us to identify additional ways she coregulated with students to reduce their stressors. This required being pre-emptive of stressors and, at times, “winging it.” Larissa acknowledged the accumulative stress experienced through constant co-regulation of so many children. This stress often resulted in feeling anxious prior to the class beginning, or going home feeling “completely burnt out because you have had people at you the whole time,” and “you’re having to give so much of yourself.”

Larissa’s teaching time resulted in low energy and high tension. When asked how she might be able to restore she suggested, “more space away from the children,” continuing, “like anything, when you have time away it gives you that ability to reset.” She disclosed that one way teachers restored was by taking stress leave, “because it gives them that time.” She was confident that her imminent departure from the school would provide the restoration she needed.

Findings From Lynda’s VLC

Lynda had been videoed in all iterations and participated in the first VLC. She was not available for the second VLC and experienced difficulty in accessing TORSH due to an error in her email address, a problem we rectified during this session. This resulted in parts of our conversation being interspersed with learning how to use the platform. The conversation covered how Lynda was putting the PL into action, her experience of being videoed and viewing her own videos and those of others, co-regulation, and her own personal strategies for self-regulation. Lynda also shared her growth in understanding of self-regulation and how it was changing her perception and practice.

In Iteration 3, Lynda shared how she was applying the PL. She used the snapshot across the 5 domains to consider where her stressors were, endorsing this as, “a really good tool to use, and it has been noticeable that yeah, depending on how I’m feeling and my mood, sets the scene for myself when I start to teach.” When prompted to share her use of the 5 steps, Lynda said she was “not naming it up” as the 5 steps, adding, “I’m noticing what I’m doing more so than what I did before you coming in and doing the sessions.” Lynda also indicated an increase in her reflective

practice commenting, “I actually look at [the situation] afterwards and then think, okay, what happened there? Why did I actually react so quickly? What can I do next?”

The application of PL through video was noted by Lynda as being “amazing.” This included both viewing her own videos as well as others’. Her enthusiasm was expressed overtly:

> I’ve really loved actually doing it, and with you. And it’s just been so…..I think seeing yourself, watching yourself being played back and seeing yourself in the moment where your stress levels go up or down, or stay really calm, it just gives you a whole big perception of yourself.

When viewing others’ videos, Lynda noticed how she could see what was happening and connect it to stressors and how they were being managed by others concluding, “yeah, it’s been fantastic, I’ve really, really, enjoyed it.”

Co-regulation was mentioned throughout the conversation. This was occurring with colleagues as well as students. Lynda commented on how debriefing with staff after a particularly challenging afternoon supported her in reducing stress. Coregulating students occurred in the way she navigated the questions she posed to students, whom she posed them to, and how she responded if she noticed the question caused significant student discomfort. She connected how calm brought about calm, noting “the kids were feeling relaxed and calm. That made me calm.” Lynda supported students in advocating for their needs (choice in what to sit on, when to eat) supporting their individual regulation needs.

Lynda identified a variety of ways she self-regulated when stress was present and what she did to prevent or mitigate stress from arising. She walked away to give others time to calm down and reduced her own escalation in moments of student dysregulation. She gave an example:

> Last term, I was sort of doing some of it, but now I'm finding I'm really focused now on it, like you just said, I don't need to add to the chaos. I can move away from the situation that keeps me regulated where I should be. And I don't get upset and whatever, and also gives them time to get their stuff back into that regulation as well.

She also recognised the importance of movement for her own regulation. When reviewing the video, she commented:

> Yeah, I do a lot of that, what's it called? biological domain? where I'm rolling around the chair or I'm sitting, standing or I'm on the floor or... Yeah. And I must need that as a person to get myself regulated I just, like I said, I just can't sit still.

Pre-emptive measures to mitigate stressors included doing an energy and tension snapshot to assess her own stress levels, being organised, recapping learning, and reselecting students to answer questions when she could detect signs of student stress.

There were examples of Lynda's professional growth throughout the conversation. She shared, "Before the actual PL with yourself, I probably wasn't tuning into [the students'] wellbeing and what they were like with the trauma and being dysregulated or what actually triggers them off." She added, "I've found that now I'm in tune with what the students need as well as my need to myself, to make sure they are regulated as well." Lynda also indicated an awareness of how her own regulation impacted her teaching noting, "now that I'm very reflective of if I'm actually not regulated, I find my teaching is not where it should be and it's not engaging." She added, "I find it's been very beneficial for myself now that I can recognize myself at this stage when I'm feeling dysregulated, and I need to actually be regulated to make sure the kids are regulated as well." When reflecting on her own growth, Lynda concluded, "this year, I've had a lot of growth in experiencing a lot of things, especially looking at myself and reflecting on the learning and thinking - Wow, I am actually doing that!" She continued, "But now I'm going to try and improve myself and make sure that I keep myself, my stress levels down." Recognising that her own regulation was a priority more so now than before, she concluded:

> Well, it's my turn now and not be so selfless. I'm tuning into myself more so now than the student. I am with the student, but I'm thinking about myself as well. Because I need to be regulated so they can be regulated as well.

Finding From Mike's VLC

Mike opened the VLC in Iteration 3 by sharing how challenging the year had been. He indicated that he had seven students with severe trauma in his class and shared his belief that their needs could not be met in the mainstream system. Mike acknowledged that PL helped him understand the science behind how the brain responds to stress, allowing him to explain this to others. It had also given him tools that he was using to understand and manage his own stressors. Mike shared his own stressful experience and reframed this and gave insight into how difficult it was to meet the needs of his learners. He shared strategies that were effective in reducing stress for both himself and his students.

Mike revealed that he discussed his stressors at work with others outside his workplace. He explained how these people were, "intrigued with the kids that we work with, and they obviously understood that it's been a difficult year for me, teaching wise." The PL had enhanced his ability to describe and understand the brain/body response to stress. He shared, "I've been explaining to them how the brain works, so I guess, I've got a base knowledge now after all the PL that we've done." The terminology of the 5 Rs (reframe, recognise, reduce, reflect, and respond) associated with the PL continued to be an area in which Mike was gaining confidence; however, he stated that he was at the "recognise and reduce stage," always asking, "why has this happened?" and "what do I need to do [to reduce the stress]?" He applied what he knew to self-regulate himself and coregulate his students.

Student dysregulation was extremely high in Mike's class. Mike spoke of "vicarious trauma" and indicated how, "some of the stuff is horrific." He reported how one student had "been taken away from her parents," and another had just lost his grandfather who had been a main carer. Another student received an assessment indicating high anxiety, autism, and selective mutism. This student attended 40% of the time, had not spoken at all whilst at school, and stiffened/froze whenever Mike spoke to him. Other students guided and coached this student to support his learning. Mike acknowledged the prosocial stress he carried through empathy and worry for his students as well as frustration that he was unable to be an effective teacher for some. He understood the individual approaches needed for each of his students stating, "I'm

a lot more aware of student stress and how I can impact on their stress." One student, described by Mike as spending significant amounts of time in the Green Room (an alternate learning space for students for whom the classroom was not working), was triggered if shut into a classroom. Mike's deep loud voice triggered other students. In response to student dysregulation, Mike asked himself, "Why has this happened? What did I do to make their stress rise?" noting his own increased stress and prompting reflection to consider ways to reduce stressors next time.

When I asked if he reframed any of his own behaviour from misbehaviour to stress behaviour, Mike shared a story from earlier in the week. As he told this story, he laughed as he described his negative experience. He recalled returning on a bus with a group of students at the end of the day:

> I had some students who were poking me in the stomach area, and they thought they were being funny, and for me, that was just like this is one, inappropriate, and two, it's very annoying. They were kicking me in the heels, and I'm doing my best to ignore it, and it was right at the end of the day.

He continued to explain how the bell went and one of the administrators walked in. Mike described, "I just exploded with swear words, and anger and frustration at my job." Mike felt "hamstrung," "physically harassed", and "annoyed" and was able to reframe this explosive behaviour as stress behaviour.

The video in this iteration provided examples of strategies Mike and his students used to manage stress. These included having a piece of putty to play with, advocating for brain breaks when needed, keeping activities short, developing students' vocabulary, and ensuring routine. The importance of routine was emphasised by Mike through a variety of statements: "These students need to know what is next," "if you break routine, you've ruined their day," and "you have to remind them five times if routine is going to be broken." Mike was also making decisions about how he responded to students to reduce his own potential stressors. As he described this, he began by suggesting he was attempting to control their behaviour, but then changed his own language, "not control but adjust their behaviour."

Findings From Henry's VLC

Henry had been part of this research from its inception. He had attended all the PL, engaged in the whole group discussions, and in this iteration had also chosen to be videoed for the first time. He had a unique role in the school as the teacher in the Green Room. This room provided a space for learners who were frequently dysregulated in their regular classroom. I videoed Henry working with a small group of students in this space. These learners received individual or small group instruction with Henry as their main teacher. Two teachers were usually assigned to this room, and they often accommodated up to eight learners.

Since recording the video, Henry had become part of the senior leadership team in the school. In his new position, additional school-wide expectations were added to his teaching role in the Green Room. My conversation with Henry centred on the stressful nature of his role, student-teacher relationships, and collegial co-regulation to manage the prosocial stressors associated with working at this site.

As our conversation began, it quickly became evident that Henry was experiencing an unsustainable amount of stress resulting from his recent promotion within the school. He explained:

> So when I'm not in the [Green] room I'm everywhere trying to put out fires, look after everything, which I was doing before, but now at a more official level. So for the last two, well for the last five weeks, I've basically been running around all morning going out into the playground at recess, going straight into here, doing that again at lunch time and then going back in.

Considering the domains, he added, "biologically it hasn't been the best," sharing how the hectic schedule regularly resulted in not enough time to eat lunch or take bathroom breaks. There was also reduced staff support in the Green Room due to staff supervision of the swimming program. As he explained these aspects, alerts were sounding on his various devices, signalling communication between senior staff arranging who was responding to calls for help from teachers or passing on information about students whose behaviour was escalating or already in allostatic overload. This system had been set up by Henry to reduce the "stress on [senior

staff]", allowing them to be dispersed across the school, and, "not all be in that central area near the staff room where it gets really hectic."

His reflections on the video began with an explanation of how Tuesday's filming was a calm one, further explaining that "Tuesday just gone, I had a broken glass bottle thrown at my head from a student." When asked how he managed this stressor he replied, "I don't think I really processed it until I got home because it was just going from that, sorting out that, and then you know, straight in [to the Green Room]." Upon reflection, he saw some signs leading into the situation, "thinking back from Tuesday, things didn't go so well when we first came in. Students were unsettled, they didn't follow their normal routines and students were kind of wandering everywhere." Wondering if students were aware of the stressors he experienced, Henry commented, "I think I'm good at hiding that quite well from the kids, but maybe I'm not." This led to a brief conversation about how people's limbic systems can share emotion or emotional states, also known as limbic resonance (Shanker, 2022a).

Henry and I discussed student-teacher relationships. He explained the diversity of interactions and approaches he used depending on the student. Early in the video, a student came into the room and Henry shared, "[He} was having a dig at me about my football team." This prompted Henry to state, "that's a relationship builder," then question, "but is that a tester for that student to see where I'm at?" Another student never removed his hoodie, so Henry often needed to monitor this child for overheating. Yet another student had significant cognitive stressors about getting any support in mathematics as his fragile self-esteem hung on his reputation for being the "best at math in his family." Henry explained the language he used and how over time the student's acceptance of help with mathematics learning shifted. Henry would say, "You're really good at math, but you're only grade-five-smart and I want to help you move to grade six math next year." For two of his students, Henry shared, "the way I talk to [these two students] is different to everyone else in terms of, I like to, well not razz them up to set them off, but you know, to have a little bit of fun with." Henry also indicated that students coregulated teachers at times sharing, "with the clientele, depending on the students as well and how their frames of mind are, they do look

after us as well," quickly adding, "Yeah, but if they're not in that space, then there's no chance of that happening."

Co-regulation was not only evidenced by Henry in student-teacher relationships, but also among colleagues. As mentioned earlier, senior staff used an alert system through email to communicate and triage situations arising across the school and ensure people were deployed to locations needing this. In this way, team members supported to each other, other staff members, and students. Henry shared further examples of the critical coregulatory role his teaching partner in the Green Room played. During the video, his teaching partner left the room to locate a student and Henry was able to remain with the five other students, leading and supporting their learning. He explained:

> If there's fires going everywhere we can't deal with it. And we've got kids running in and out and the beauty of having two is you are able to relieve each other's stressors and one person can say, right, I'll go find out what that student's doing or why they've ran out while the other stays in and vice versa.

Additional stressors arose for Henry when school scheduling for swimming lessons required extra adults. Henry and his teaching partner were assigned to support swimming over these weeks, resulting in only one adult in the Green Room, increasing the stressors for that remaining adult (while reducing stressors for those teachers taking classes swimming).

Collegial co-regulation also reduced the intense prosocial stressors participants experienced, which Henry described as being "out of our control." Henry explained, "a lot of our stressors can be vicarious through the students as well. So, knowing stories from home, knowing things that have happened." To deal with this, Henry commented, "as a staff we're good at chatting with each other. Certain pods will have different friendship groups who might go and have a drink or coffee or something like that." He added, "we have a little group message thing too, where we might post funny things, not about the kids, but just random things we see on the internet to try and make people laugh." Henry shared that "we do kind of work really closely because the common goal is to make a better life for the kids." Knowing about their lives helped Henry reframe behaviour because he understood "why they can't sit down and

they're wandering around or they're throwing things," concluding, "how do we turn that around?"

Henry shared that the PL had reassured him. It had confirmed the importance of knowing the students, developing relationships with them, and knowing when to "pick your battles." It also confirmed for him that restoration provided by brain breaks was good for both students and teachers. When asked what was challenging about applying the learning Henry laughed, "It would be a lot easier if the students weren't there." He continued:

> Well, it is up to the students really, like in terms of what's happened at home, at recess, three seconds before they came into the room, and then finding out what their needs are, to then meet the group's needs, and then our needs really come last.

Questionnaire

Some of the findings from the questionnaire were combined with the PL findings and shared earlier in this chapter. The remaining questionnaire results are described in this section. Iteration 3 was the final component of the research and concluded my 20-month research relationship with participants within their context. I first met participants in February 2018, and this final questionnaire was completed on October 24th, 2019. Throughout this research, staffing changes at the school, other PL sessions occurring concurrently to my research sessions, and teacher absence affected the roster of participants (see Table 3).

Fifteen participants, with varying levels of participation across the research, attended this final session and completed the anonymised questionnaire. Of these 15 participants, six demonstrated high involvement indicating participation in 10-14 of the 14 research elements (including the video learning conversation component). Five participants reported medium involvement, (six to nine research elements not including the video component), and four participants showed low involvement (with one to five elements and no video component). These involvement levels were significant as they captured the disruptive nature of inconsistent participation in school-based PL. Involvement levels were considered when I analysed the data from this questionnaire.

Participants were given 45 minutes to complete this questionnaire. I remained in a separate part of the room to answer any questions.

Responding to questionnaire prompts, participants provided:

- their definition of self-regulation;
- examples of powerful modes of self-regulation learning;
- details of their perceived growth in understanding and application of self-regulation;
- reflections on their experiences in the video component of the research;
- perceptions on the influence of self-regulation learning their own stress management and examples of where, when and with whom they were applying self-regulation;
- their understanding of Self-Reg (the 5 Steps and the 5 Domains);
- their views on the importance of various aspects of PL, the presence of these aspects in this research, and whether they took up PL opportunities offered (these findings were shared the PL section of this chapter);
- future self-regulation learning intentions; and,
- final comments.

Findings From Questionnaire 3

Questionnaire data were analysed thematically and used to further consider the design principles and research questions (further described in Chapter 7). Themes from the analysis included:

- the stressful nature of the context;
- relational safety and trust;
- changes in participants' definitions of self-regulation;
- changes in participants' thinking, actions, and perception; and,
- a deeper understanding of how participants learnt and applied new learning.

Q3 Theme 1: The Stressful Nature of the Context

The stressful nature of the context gave purpose to the learning. Participants shared gratitude that this learning was focused on them and the strong need they felt for this. One specified how the learning allowed them, "to start to think about OUR

Self-Reg, to begin to change our practice to make sure our needs are being met." Questionnaire response analysis linked the challenging context to participants' learning. This link was evident when participants reflected on their own learning, applying learning, and future learning.

Participants indicated how the context made it difficult for them to learn. One shared, "Teaching at [this school] is stressful a lot of the time as is, and I found learning about something completely new after stressful days was challenging." Others reported, "Some of the science and theories are hard to take in after a day of teaching," and "understanding the 5 domains when managing my own stress levels" made the learning challenging.

Contextual challenges made application difficult. A teacher with low involvement in the research commented, "Seriously – a teacher at [this school] – how to reduce stress load!!!! You wanted honesty. This last week has been like a warzone." Another shared the challenges of, "being able to remain calm myself during stressful situations and remember the best way to approach the situation." For a third participant, they found application challenging, "when faced with multiple dysregulated kids in one room."

The context was specifically noted when participants considered future learning. A highly involved participant reported, "This HAS to continue to be a priority focus area for our school," whilst, participants from the medium and low involvement groups commented, "It will always be necessary and worthwhile in a school like this," and, "Yes – this is always going to be an essential need for us as teachers – particularly in a school like [this]." One participant suggested no further need for this learning explaining, "I am moving to a new context where emphasis on Self-Reg won't need to be as extensive," suggesting the context was the reason, the *why*, for their past engagement in learning, deemed less important in another context.

Q3 Theme 2: Relational Safety and Trust

Safety and trust within professional relationships were referenced throughout the questionnaire. Responses indicated that both relationships between participants and the PL facilitator as well as between participants themselves were important, with a greater importance reported for the latter. Some participant comments suggested a

connection with the PL facilitator was important. One participant justified that the neurosequential model workshops were so powerful because they, “felt connected to [the presenter] and her presentation.” Another participant shared, “If I feel a connection with a presenter, I am more likely to want to understand and [I am] comfortable to ask questions.” This connection also supported participants’ involvement in the video learning conversations component. One participant stated, “If most people were to video me in the classroom, it would make me very unsettled and nervous. Marie made me feel unjudged and calm about the experience.” When asked about future participation in this element of the research, one participant responded “yes, if Marie was doing the filming – others might make me nervous,” suggesting that safety and trust in the relationship was an important factor.

The majority of participants placed high importance on relationships with colleagues and reported this was mostly or always achieved. One indicated this was only sometimes achieved revealing they felt “left out” as it “seemed like only the ‘in’ group were involved” in the videoing. This suggested poor relational trust and resulted in no engagement in the video and VLC opportunity. Others, who were not interested in being videoed, cited lack of confidence, discomfort, and anxiety, all suggesting a potential lack of safety or relational trust.

Q3 Theme 3: Changes in Definition

Over the course of the PL, specific aspects of participants’ definitions of self-regulation shifted including the *what*, *how,* and *why* of self-regulation. The definition of *what* was regulated broadened over the research. Originally participants only specified emotion and behaviour as *what* was being regulated, whereas cognitive and biological regulation examples were also included in Iteration 3.

Self-Reg theory clearly distinguishes self-regulation from self-control (Shanker, 2020). This was another part of the definition that shifted. Initial questionnaire responses referenced “control” eight times; four indicating *how* (through self-control) and four about *why* we self-regulate (to gain control). In the final questionnaire, only one participant referenced “control” in their definition: “Being able to use learned strategies to control an emotion or reaction to an incident before, during, or after it occurs.”

Definitions also included the purpose for self-regulation – the *why*. In the first questionnaire, seven reasons included "learning" and two noted "to be calm and safe." The opposite occurred in Iteration 3 with six references to "calm" and one to "learning."

These three examples demonstrated that participants understood self-regulation involved more than just emotion and behaviour regulation, understood more about the distinct difference between self-control and self-regulation, and that being calm was a pre-requisite for learning.

Q3 Theme 4: Changes in Thinking, Action, and Perception

Changes in thinking were evident in the questionnaire data. Participants shared their raised awareness about self-regulation and their further understanding of situations through reflection. One participant shared:

> I feel now that I am aware of how to manage my stress level. If I am calm and organised for my day/lesson and the students are, then it makes it so much better for everyone. I know when I am not regulated. I need time to quickly think about 'how to stay calm' and move forward with what I am doing.

Another shared their practice of reflection to consider how they "could have done better" or ponder why their "reaction was a particular way."

Participants shared how their actions changed with strategies, planning and organisation, and participation in self-regulation activities. One participant shared their change in action, "I use strategies that I have learnt, multiple times during the course of a day, in fact, multiple times in the course of a lesson with tier 3 children." Others considered planning and organisation changes, such as "structuring [the] timetable to include mindfulness/ calming time; biological factors – food, temperature, seating," and "classroom structure, use of voice, allowed time for myself, permission to reset the class." Another participant reported a new practice of taking advantage of self-regulation opportunities by "joining in during Self-Reg times such as brain breaks, yoga, or meditation."

Participants' perceptions also changed. This occurred mostly through their practice of reframing behaviour. Examples that highlighted this included: "Understanding that most behaviour is stress behaviour. This has made me more

understanding towards most behaviour," and "I need to remind myself sometimes that behaviours are mostly stress behaviours, especially when I am stressed, and the behaviour is making me more stressed."

Q3 Theme 5: How Participants Learned and Applied Self-Regulation Knowledge and Skills

Analysis of questionnaire responses evidenced the messy and nonlinear process of learning about self-regulation. Some participants had years of learning through personal work with health professionals, their own research, or personal yoga and meditation practices, while many participants experienced a variety of school-based PL opportunities in addition to the Self-Reg intervention for this research. Participant language reflected specific PL terminology. At times, terminology from one PL was coupled with actions from another. An example of this was Lynda who continued to use Zones of Regulation language while considering the 5 steps of Self-Reg and the 5 domains of stress to guide her actions. Adding to the messiness, participant numbers in the PL fluctuated, resulting in missed PL sessions or new participants arriving part way through.

A small, yet growing, number of participants engaged in VLCs. For some this proved to be an effective PL approach, with one participant commenting, "to be able to view my practice as a teacher with guidance around my own self-reg, was powerful and reassuring." Other participants were unwilling to choose the video option at this point. Some participants who were hesitant to be videoed showed curiosity to view colleagues' videos and affordances of this were evident in the data, demonstrating annotating someone else's video as another way to apply the learning. Video participants commented on the affordances of using TORSH as a repository for the videos and a platform for annotation supporting their PL. In amongst all the learning, concerns continued to be voiced about a small number of colleagues who were not "seeing it" yet.

Despite the "messiness," all participants indicated growth in their self-regulation knowledge and application regardless of their level of involvement. Many reported that workshops for Self-Reg and the Neurosequential model were the most powerful forms of learning on this topic. Comments included, "[The Self-Reg

workshops were] powerful for me because [they] gave me an understanding as to why people behave as they do when heightened of under stress," and "the mix of practical and theoretical knowledge made this a great process, particularly the work on stress behaviour not misbehaviour, which helped many people reframe their thinking."

Printed programs, informal conversations, and video provided further examples of powerful PL for a smaller number of participants. Comments suggested that printed programs provided a framework for a whole school approach, shared language, and visual resources. It was interesting to note that across the questionnaires, participants continued to include printed programs as a mode of PL for self-regulation, yet over the course of the research they ranked it as having a lesser effective on their practice over time.

Informal conversations were cited as powerful. One participant reported:

> [During] informal conversations with [PL presenters], I can ask questions relevant to children I work with. I can then apply what I learnt the next day. The sooner it is applied the more likely it is to become part of my practice.

Another participant shared how informal conversations, "provide collegial support and student/teacher/school/history information that I can then digest and use." Informal conversations allowed for personalisation, offering immediate feedback and the opportunity to ask individualised questions.

Iteration 3 provided the opportunity for all participants to experience PL through video, and a section on the questionnaire asked participants about their involvement in this aspect. Six participants were videoed and engaged in follow up VLCs, seven participants who were not videoed, viewed and annotated a colleague's video, and two participants had not engaged in any video component. Although participant involvement in the video component grew over the course of the research, there continued to be some who chose not to engage in this element. Reasons for not participating in the video component identified in the questionnaire included discomfort, shyness, lack of confidence, and scheduling conflicts. For one, a sense of not belonging and the experience of prosocial stress were identified as deterrents.

Six video participants rated their unique experiences from daunting to no stress at all. Daunted by the experience to begin with, one participant stated, "I was

stressed as I find this to be nervous, someone watching me and my practice. My thinking was, what if I say/do the wrong thing?" This participant continued, "but once I experienced the first one, and received feedback from Marie – I was really amazed at what I was seeing and the comments that I received made me feel very reassured." Another participant described how they "really enjoyed the experience and found it extremely beneficial" to review her Self-Reg practice, referring to the VLC and how it helped highlight Self-Reg practices she had adopted that she wasn't aware of.

Factors that reduced stressors for participants included routine, having a safe relationship with the videographer (not feeling judged), the experience of being videoed, and being reassured by feedback. PL affordances included being able to observe Self-Reg in action, receiving feedback, witnessing one's own practice, feeling calm while being videoed, and increasing awareness.

The TORSH Talent platform enabled easy access to videos and annotations and was mentioned by video participants. One participant reported, "despite not sitting down with Marie to review the video it was fantastic to be able to use TORSH to do so. Reading and responding to comments made me more self-aware." This flexibility enabled PL to continue asynchronously. TORSH was also considered for other PL conversations beyond the research, "I think TORSH or similar would be fantastic to use for classroom walk throughs/observations."

Projecting into the future, participants were asked if being videoed was something they would consider. Nine participants indicated they would, and six indicated they would not. All participants with previous experience being videoed indicated their future interest adding comments like, "Yes, it is a great reflective tool", and "Yes, I would be happy to be a part of the video experience again as it draws attention to your own Self-Reg and if you are using the 5 Domains throughout your teaching." Three participants who had not been videoed shared their interest for this if a future opportunity arose. One was interested to see how often they employed self-regulation techniques in a lesson, and another was interested in seeing what they did to self-regulate and build more strategies for this. The third indicated an interest in both being videoed and seeing others using Self-Reg in their classrooms.

Q3: Participants' Final Comments

My final prompts in the questionnaire asked participants if they felt it was important to continue PL on self-regulation beyond this project. Eleven participants agreed while four disagreed. Among the comments in favour of continuing self-regulation learning, participants suggested how it "keeps us updated with current research, keeps it at the forefront of our minds, keeps as something we focus on within the school and classroom", and there was a "need to learn more and put this into action." Those who did not see value in continuing the PL represented all involvement groups. Two participants from the low involvement group shared, "I have done a lot of my own personal self-regulation," and "[I] prefer to learn through other mediums." The participant from the medium involvement group justified, "I have my own personal methods, collegial support, and now [this] learning," while the participant from the high involvement group shared their plan to leave the school, resulting in less need to learn more about this topic. These comments highlighted three themes: participants' perceptions that their personal learning would suffice; alternate ways of learning about self-regulation were preferred; and, the learning was considered context-specific.

The questionnaire concluded with an invitation for final comments. These comments were grounded in gratitude and expressed the value of this learning. Amongst the "thank yous" and "best wishes" was also the question, "How do you help someone recognise that they need help?" This question was a reminder of the ongoing nature of this work, how each person has their own unique experiences of stress, and how this may interrupt or promote the learning and application of self-regulation.

Chapter 6 Summary

In this chapter, I presented the findings from the final iteration. I used some end-of-iteration questionnaire data to enhance beginning-of-iteration PL findings as I applied humanistic lens (supported by the 5 domains of stress) across the DPs. VLC findings highlighted growth and change in participants' application and embodiment of self-regulation knowledge and skills, and the continued experience of allostatic load felt by participants. Questionnaire data also evidenced the stressful nature of the

context, highlighted the importance of safety and trust in relationships, examined changes in participants' understanding of self-regulation, and changes in thinking, actions, and perceptions. In this iteration, the messy, non-linear process of self-regulation PL was confirmed and the many modes of PL reflected upon. I drew attention to the affordances of video (for both the video and non-video participants) and the powerful way this provided opportunities to "see" self and practice.

In the following chapter, I discuss the findings from the three iterations of research through the lens of the research questions, design principles, and the literature. I suggest aspects of PL trajectories for consideration and apply these to Thompson et al.'s (2020) iterative model of teacher PL.

Chapter 7: Discussion

Understanding Professional Learning Trajectories

Chapters 4, 5, and 6 shared the findings from three iterations of research occurring in 2019. In this chapter, I discuss these findings. To begin, I provide the context and frame for discussing these findings by summarising the research, the research questions (RQ), and the methodology. Following this, I address each RQ drawing from my findings, the literature, and the evolved design principles (DP). The chapter concludes with aspects of PL trajectories for consideration, recognising how learning transpired differently for each participant over the course of the research and the ways in which these aspects add to other models of PL within the literature. Therefore, I have organised the chapter into the follow sections:

- Framing the discussion;
- Research question 1;
- Research question 2;
- Research question 3;
- Aspects of PL trajectories; and,
- Chapter summary.

Framing the Discussion

I began this research with almost three decades of lived experience as a teacher and leader in primary schools in both Australia and Canada. This gave me first-hand experience of the diversity and intensity of positive and negative stressors inherent to being a teaching professional in a diversity of contexts, as well as my own experiences of effective (and ineffective) PL. In addition to this, I brought eight years of Self-Reg learning and application to the research: I practiced Self-Reg in my own learning environments; facilitated self-regulation PL for teachers in my schools and within the broader school district; and engaged in ongoing PL on Self-Reg through The MEHRIT Centre. Self-Reg was also the centre of my master's research in 2013.

As I prepared for this doctoral research, I engaged with the literature. I discovered it was rich with evidence of teacher stress and burnout (Chang, 2009;

Kyriacou, 1987; Simon & Moore Johnson, 2015) as well as investigations of what constituted effective PL (Avalos, 2011; Borko, 2004; Darling-Hammond et al., 2017; Muijs et al., 2014; Opfer & Pedder, 2011; Timperley, 2008, 2011). The need for teachers to learn about stress management was evident in the literature (Harris, 2011; Prilleltensky et al., 2016); however, evidence of *how* teachers were learning about stress, their understanding of the brain/body response to stress, and if/how they applied this to manage their own stress was harder to find. Negative effects of teacher stress on students were noted in the literature (Jennings & Greenberg, 2009; Jennings et al., 2021; Kyriacou, 2001; Oberle & Schonert-Reichl, 2016; Ramberg et al., 2020), bringing further impetus to my research: By supporting teachers to develop their capacity to self-regulate, their students would also benefit.

I committed to develop teachers' self-regulation to support stress management to further inform this area within the literature. To do this, I posed three overarching questions:

- RQ1: *How* do primary school teachers in a low socioeconomic school effectively develop self-regulation knowledge and skills?
- RQ2: What *enables* and *constrains* their application of self-regulation knowledge and skills?
- RQ3: How does the learning and application of self-regulation knowledge and skills influence how teachers manage stress?

I employed design-based research methodology to explore these questions and aligned my research with the six signature features of design-based research described by Anderson and Shattuck (2012). My research:

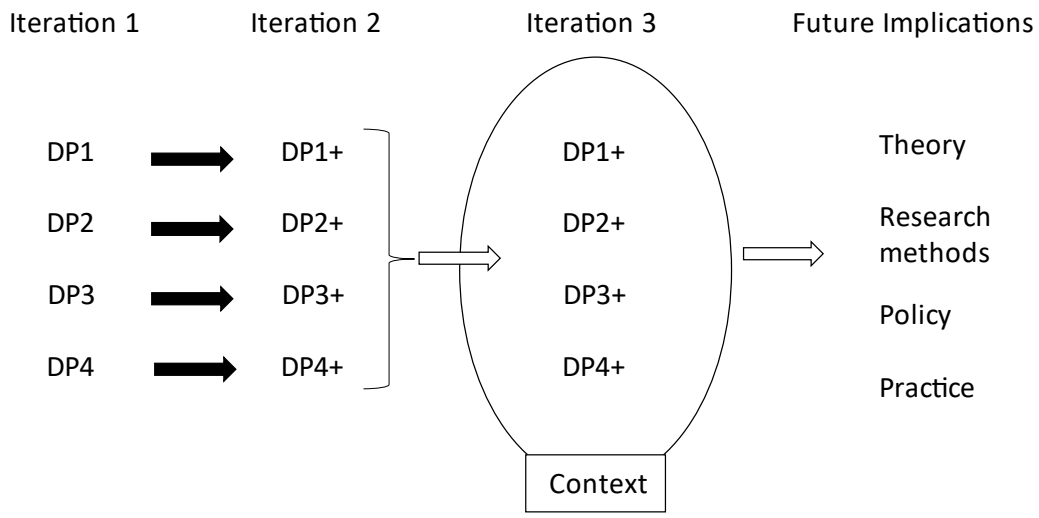
- was situated within a low socioeconomic primary school in regional Tasmania;
- focused on the design and testing of an intervention: Effective PL using Self-Reg theory (including VLCs that used the VIPP model (Juffer, 1993) and using TORSH Talent as a video repository and annotation platform);
- used a pragmatic, mixed methods approach to data collection;
- included three iterations;
- involved collaborative partnerships between myself as researcher and the participants (teachers and leaders); and,

- evolved design principles.

The evolution of the design principles occurred at the conclusion of each iteration using the iterations' findings to engage with the literature. This process resulted in adjustments to principles in preparation for the next iteration. In this research, the evolution from Iteration 1 to Iteration 2 was linear (see Figure 26).

Figure 26

Design Principle Evolution



The wording of the original design principles (DP) was modified (slightly or significantly) to reflect the findings and the literature, resulting in an evolved set of design principles (DP+). Table 24 shows the evolution, with changes in wording indicated by italics.

Table 24

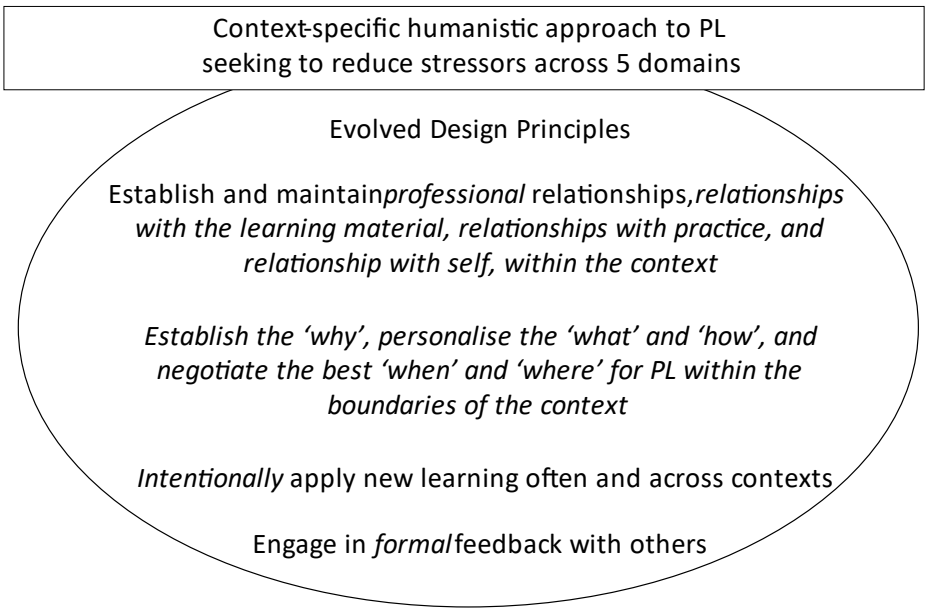
DP Wording Changes From Iteration 1 to Iteration 2

Original design principle	Evolved design principle
DP1 Establish and maintain effective relationships	DP1+ Establish and maintain *professional* relationships and *relationships with the learning material within unique contexts*
DP2 Ensure relevant and effective dissemination of knowledge and skills	DP2+ *Establish the 'why', personalise the 'what' and 'how' and negotiate the best 'when' and 'where' for PL within the boundaries of the context*
DP3 Apply new learning often and across contexts	DP3+ *Intentionally* apply new learning often and across contexts
DP4 Engage in feedback with others	DP4+ Engage in *formal* feedback with others

Between Iterations 2 and 3, the evolution was not linear: DP+s remained the same in wording with the exception of one addition to the wording of DP1+; however, due to the intensely challenging context the participants were learning in, I applied a humanistic lens to evolve all DP+s. I used Self-Reg theory to apply this humanistic approach for the final iteration, seeking to reduce stressors for participants across the five domains to support their capacity to engage in the learning (see Figure 25 shared previously and once again here).

Figure 25

Evolved Design Principles With Humanistic Approach



This context prompted my intentional application of a humanistic approach for PL, resulting in the wholistic rather than linear evolution of design principles. This was validated within the literature as Anderson and Shattock (2012) explained:

> These principles are not designed to create decontextualized principles or grand theories that function with equal effect in all contexts. Rather, design principles reflect the conditions in which they operate. These tools and conceptual models function to help us understand and adjust both the context and the intervention so as to maximise learning. (p. 17)

This quote described my approach for the final iteration. I understood and responded to the contextual stress by using the 5 domains to reduce stressors where possible so that participants would have the best chance to be in a state conducive to learn and Self-Reg learning (the intervention) could be maximised.

In this discussion, I use the findings and literature from the evolution of DP1 and DP2 to address the first research question (RQ1) (see Table 25).

Table 25

Evolved Design Principles Informing Research Question 1

RQ	DP evolution addressing RQs		
RQ1 *How* do primary school teachers in a low socioeconomic school effectively develop self-regulation knowledge and skills?	DP1 Establish and maintain effective relationships	DP1+ Establish and maintain *professional* relationships and *relationships with the learning material within unique contexts.*	*Context-specific humanistic approach seeking to reduce stressors across 5 domains when* establishing and maintaining professional relationships, relationships with the learning material, *and relationships with practice* within unique contexts
	DP2 Ensure relevant and effective dissemination of knowledge and skills	DP2+ *Establish the 'why', personalise the 'what' and 'how' and negotiate the best 'when' and 'where' for PL within the boundaries of the context*	*Context-specific humanistic approach seeking to reduce stressors across 5 domains when e*stablishing the 'why', personalising the 'what' and 'how' and negotiating the best 'when' and 'where' for PL within the boundaries of the context

Then I used the findings and literature from the evolution of DP3 and DP4 to address RQ2 (see Table 26).

Table 26

Evolved Design Principles Informing Research Question 2

RQ	DP evolution addressing RQs		
RQ2 What *enables* and *constrains* these teachers' application of self-regulation knowledge and skills?	DP3 Apply new learning often and across contexts	DP3+ *Intentionally* apply new learning often and across contexts	*Context-specific humanistic approach seeking to reduce stressors across 5 domains when* intentionally applying new learning often and across contexts
	DP4 Engage in feedback with others	DP4+ Engage in *formal* feedback with others	*Context-specific humanistic approach seeking to reduce stressors across 5 domains when* engaging in formal feedback with others

RQ3, *How does the learning and application of self-regulation knowledge skills influence how these teachers manage stress*, is informed by the findings from highly involved participants and the literature.

Research Question 1

The first research question was: *How* do primary school teachers in a low socioeconomic school effectively develop self-regulation knowledge and skills? To answer this question I used my findings, the literature, and the evolution of DP1 and DP2 over the course of the research. Features characterising effective PL reported within the literature included contextual relevance, iterative approaches over extended periods of time, and the powerful nature of teachers co-learning through workshops, mentorships, shared practice, reflection, and conversations (Avalos, 2011; Cooper et al., 2020; Thompson et al., 2020; Timperley, 2008). I included these features as I collaboratively shaped the PL with participants to support their development of self-regulation knowledge and skills. What I discovered as each iteration unfolded and

through the evolution of the DPs was a theme of relationships. This started with, but was not limited to, human relationships.

Simon and Moore Johnson (2015) referenced the significance of collegial relationships within low socioeconomic school contexts. They claimed “an inclusive environment characterized by respect and trust among colleagues, formal structures that promote collaboration, and the presence of a shared mission among teachers” (p. 19) fostered these relationships. These factors were evident within my research and fundamental to *how* teachers were learning. They also applied to the relationship between me and the participants.

For some participants their relationship with me was fundamental to their participation in the video component of the research, while for others this relationship was less significant; another factor was at play. This led me to consider that human relationships were not the only relationships supporting primary school teachers in this low socioeconomic school to develop their self-regulation knowledge and skills. I noticed that participants also developed relationships with the learning material, relationships with their teaching practice, and ultimately a deeper understanding of ‘self’ through an increased ability to be self-aware of their embodied learning and practice. Stolz (2015) suggested embodiment occurs when “we ‘come to’ an understanding of something from our own point of view as a result of experiencing it” (p. 485). These relationships all contributed to *how* participants developed their self-regulation knowledge and skills.

Clarke and Hollingsworth (2002, p. 951) described four “domains” that have a substantial impact on professional growth within the context of “the change environment” in which teachers learn. These included the personal domain (knowledge, beliefs, and attitudes), the external domain (external source of information or stimulus), the domain of practice (professional experimentation), and the domain of consequence (salient outcomes). In my research, a teacher’s personal experience of stress also had a substantial impact on professional growth within the PL change environment and I would advocate for its inclusion in the personal domain within this model. Studies by Vogel et al. (2018) confirm how stress interferes with schema-related and novel learning at a neural level impairing performance.

The low socioeconomic context initially provided a background to the research; however, as the data came in at the end of each iteration, the evidence of toxic stress and trauma experienced and reported consistently by participants, demanded the context become the foreground - the lens through which this research was viewed and approached. This context made learning about self-regulation to improve stress management highly relevant; yet, simultaneously it made engaging in the learning difficult for some participants, due to the ongoing cycles of stress and dysregulation they experienced within the context.

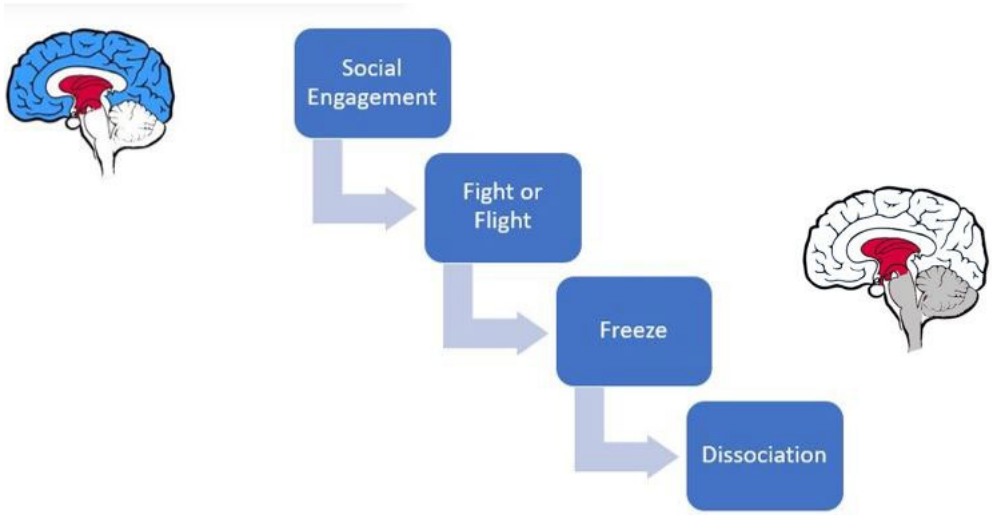
In their exploration of attentional control, Derakshan and Eysenck (2009; 2011) suggested that anxiety and stress limit a person's ability to inhibit unhelpful responses to situations, switch attention from one task to another, and update and monitor what's in their working memory to manage and complete tasks. I considered their theory of attentional control and recognised the contextual stress and the anxiety felt by participants. This led me to question whether a teacher, depleted and stressed (with low energy and high tension) due to their work context and other personal stress, had the capacity to successfully engage in their own learning. I realised this needed to be addressed as a prerequisite for *how* teachers learned within this context and therefore begin my discussion by considering the relationship between participants' energy and tension and their capacity to learn.

Energy, Tension, and Learning

Across the research, terms such as "warzone," "survival", "harrowing circumstances," "vicarious trauma," "tough clientele," and "horrific" were used by participants to describe their context, its people, and their experiences. Participants were yelled at, sworn at, punched, poked, or threatened on a daily basis, resulting in examples of Porges' hierarchy of stress responses including social engagement, fight, flight, and freeze (2007). Porges' hierarchy, juxtaposed alongside MacLean's (1990) triune brain model and the data, confirmed participants' unique experiences of stress (Porges, 2017; Shanker, 2020; Thayer, 1996) and their varying capacities to engage with others or the learning (see Figure 27).

Figure 27

Porges' Hierarchy of Stress Responses Alongside Maclean's Triune Brain



A participant capable of social engagement in the face of the stressors they experienced suggested a degree of success in their management of energy and tension in that moment (Thayer, 1996). In this state, participants had the capacity to engage in activities such as conversations, problem solving, and learning (neocortical, 'blue brain' functions) while their limbic system scanned for signs of safety or threat (Porges, 2007). The neurophysiological model of safety and trust proposed by Porges' (2017) in his polyvagal theory underscored "that safety is defined by feeling safe and not the removal of threat" (p. 23). Many examples of this were found in the data, especially within the VLC group. Beth provided one example of this in her Iteration 2 VLC. She initially acknowledged the discomfort she felt about being videoed; yet, this threat did not stop her from engaging in this PL opportunity. In fact, over the course of the VLC she admitted to enjoying watching the video, the learning that transpired, and even a willingness to share the video with others, all contrary to her initial feelings. She managed the additional stressors of being videoed and experienced the rewards this brought, resulting in her further engagement, learning, and promotion of the experience to others. Beth's experience aligned with findings from Zhang et al. (2011) who noted that, "teachers' initial anxiety about videotaping could be reduced by their actual experience" (p. 459). Over the iterations, more participants chose this video option, suggesting their perception of safety (with or without threat also being

present), and enough energy and low enough tension to socially engage in this (often stress-inducing) PL opportunity.

A participant in a state of low energy and high tension, or whose brain perceived lack of safety, is highly susceptible to dysregulation (a fight, flight, or freeze response) (Gunnar & Quevedo, 2007; Porges, 2017; Thayer, 1996) and had a reduced capacity to learn as their brain and body primed to respond to the threat (Vogel et al., 2018; Vogel & Schwabe, 2016). There were many examples of the dampening of neocortical functions as the limbic system detected threat and moved to a more energy-expensive brain/body response. This was evident when Mike yelled and swore (fight response) and described the muscular tension he felt as he was poked by students (freeze response); and or when Lynda left the room, or Beth left the school on stress leave or Larissa left the school permanently (flight response).

This highly stressful context triggered these brain and body responses in participants. Boyce and Ellis (2005) explained, “Environmental events signalling threats to survival or well being produce a set of complex, highly orchestrated responses within the neural circuitry of the brain and peripheral neuroendocrine pathways regulating metabolic, immunologic, and physiological functions” (p. 272). Designed to protect, participants’ brains and bodies automatically primed for threat within this context. Boyce and Ellis described this as “involving increases in heart rate and blood pressure, metabolic mobilization of cellular nutrients, preferential redirection of energy resources and perfusion to the brain, and the induction of behavioural vigilance and fear” (p. 273). Evidence of these biological responses were reported in the data. Larissa described the physical tension in her body, her racing heart and mind, and exhaustion, while Mike described being harassed by students and how this led to his own explosive outburst. The ongoing nature of these toxic stressors resulted in allostatic overload (McEwen, 1998) and heightened stress reactivity (as noted by Henry reflecting on students in the Green Room). These energy-expensive responses were leaving participants exhausted, depleted, and in despair. The tears and frustrations shared by Isabel, Larissa, Lynda, Beth, Mike, and Henry in VLCs and by other participants throughout the questionnaire comments, combined with

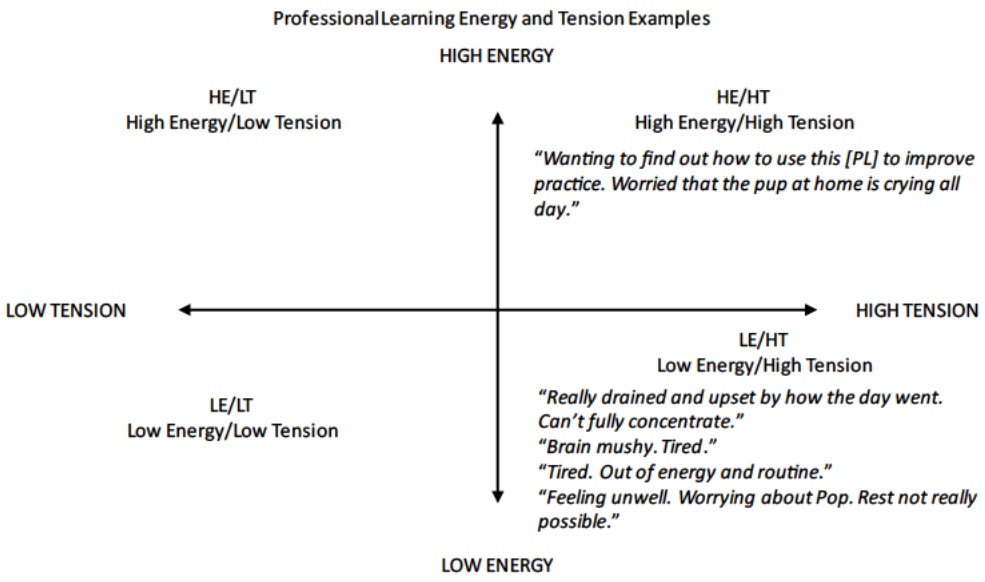
participants' stress-related absences (from one day, to weeks, to choosing to leave the school), all demonstrated the low energy and high tension participants experienced.

What did this mean for participants' capacity to engage in PL? Participants, often primed for threat, vigilant, fearful, and exhausted, arrived at the library for PL. As Thayer (1996) explained, this state of low energy and high tension exacerbated negative thoughts and low self-esteem where, "problems loom large, perhaps even seem insurmountable" (p. 14) when in this state. Iteration 1 snapshot data captured this as participants shared how they felt in their cognitive domain during the PL session, "I can't think, I don't want to think," "I can't concentrate fully," and "I'm tired." In addition to the stressors from the context were stressors from outside work. Snapshot data from the prosocial domain revealed worry for ill family members or a new puppy left at home.

The Thayer Matrix (Shanker & Hopkins, 2020) described in Chapter 2, provided a frame that helped me consider the energy and tension of participants and how I could support their learning. I reviewed participants' comments (providing justification for their placement on the energy and tension snapshots) through the four energy and tension quadrants, giving further evidence that participants' energy and tension levels were not always conducive to learning (see Figure 28).

Figure 28

Participant Comments in Thayer Matrix



My challenge was to support each participant to recognise their own energy and tension levels and take personalised actions to increase energy and lower tension affording social engagement and access to neocortical functions for learning. Thayer (2003) articulated how food and movement supported both an increase in energy and a reduction in tension, justifying my inclusion of these approaches as I planned PL. I also observed the shifts in energy and tension that food enabled, as participants laughed, had opportunities to choose, and engaged socially with each other as they shared food before the PL began.

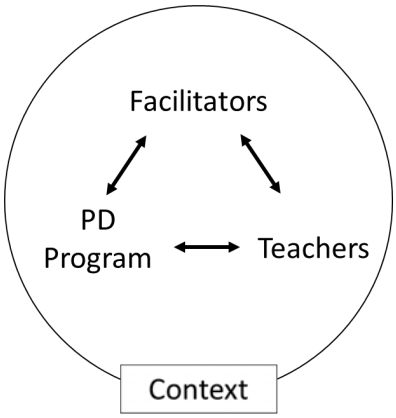
As I engaged with these participants in their context over an extended period of time, I observed how energy and tension limited or enabled their capacity to engage in PL. This was the fundamental starting point for addressing *how* teachers in a low socioeconomic school effectively develop self-regulation knowledge and skills. Without addressing energy and tension needs, the social engagement required for learning of any kind was limited. The final evolution of design principles, nested within a humanistic approach, was my response to supporting participants' energy and tension needs as they prepared to engage with the learning.

Relationships With People

Social engagement for learning required establishing and maintaining effective relationships (DP1). A learning environment that cued safety, invited vulnerability, and had a shared purpose (Coyle, 2018) supported "trusting, professional relationships" to grow (Thompson et al., 2020, p. 88). Thompson et al. reported two categories of relationships: relationships between the participants (teachers), and the relationships between the PL facilitator and the participants. Borko (2004) also recognised facilitators and participants in her model of PL (see Figure 29).

Figure 29

Borko's (2004) Elements of a PL System

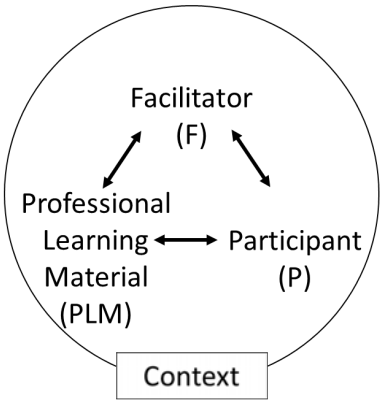


I considered the arrows in Borko's model to symbolise relationships between elements. My goal was to develop these relationships to foster relational agency; the "capacity to align one's thoughts and actions with those of others to interpret aspects of one's world and to act on and respond to those interpretations" (Edwards, 2007, p. 4). By capitalising on this relational aspect of agency, I sought to enable the production of "particular effects in the world and on each other through [] relational connections and joint actions" (Burkitt, 2016, p. 323). Relationships were an important factor of *how* participants developed their self-regulation knowledge and skills to support their stress management.

I used Borko's (2004) model to further focus on relationships within this research. To align more closely with the terms of reference within my research, I modified the terminology within the model (see Figure 30).

Figure 30

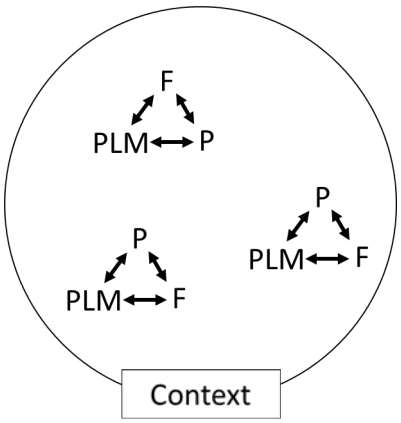
Edwards' Adaptation #1 of Borko Model



Using this model, I considered the relationships between the various elements. As the facilitator of self-regulation learning, the F-PLM relationship was strong; my priority lay in building F-P relationships and exploring the various P-PLM relationships. A further adaptation of the model represents the many clusters of these relationships within the context (see Figure 31).

Figure 31

Edwards' Adaptation #2 of Borko Model

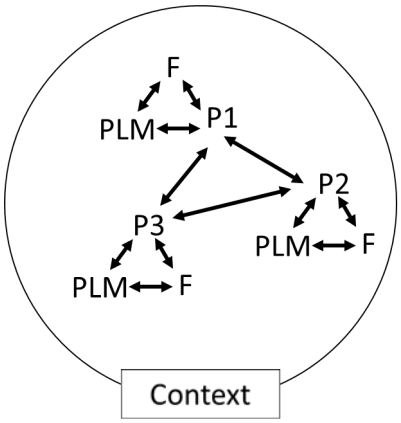


Various types of relationships were also noted. Barth (2006) described three types of relationships found in schools: congenial, collegial, and adversarial. In my role as researcher, I experienced what Edwards (2007) described as a "fluidity of [collegial] relationships" (p. 1) afforded through relational agency as my collaborations differed with different participants. An example of this was in Iteration 3 when learning needs of the group were diverse; I established new relationships with new members of staff while simultaneously maintaining existing ones in my efforts to support the individual growth of each participant.

Once again adding to Borko's model, relationships between participants were also apparent (see Figure 32).

Figure 32

Edwards' Adaptation #3 of Borko Model



Using Barth's categories, I described the relationships between participants as mostly collegial or congenial, with hints of adversarial relationships in a small sample of comments indicating feelings of not belonging to the "in group" – a prosocial stress (Shanker & Hopkins, 2020). This prosocial stress potentiated adversarial professional relationships and created additional stressors within the context for those experiencing them. There were also frustrations expressed when others did not adopt the new lens that Self-Reg theory was offering.

Klassen et al. (2013) described the uniquely high level of demand for social engagement (with students and colleagues) within the teaching profession and this was also a significant theme within my data analysis. Evidence of this theme occurred across all data sources. During the first PL workshop, participants indicated the importance of social interaction with each other; during the video learning conversations, Larissa reported how she and others supported each other through social engagement and gave examples of her leadership in providing yoga sessions to interested staff as a self-regulation strategy; and in the questionnaire participants referred to positive mentorship experiences, feeling supported, and noticing the "opening up of classrooms" suggesting growth in collegial trust and relationships. Learning as a group and examples of co-regulation were also reported. Video participants also appreciated how video gave them a window into their social engagement with students.

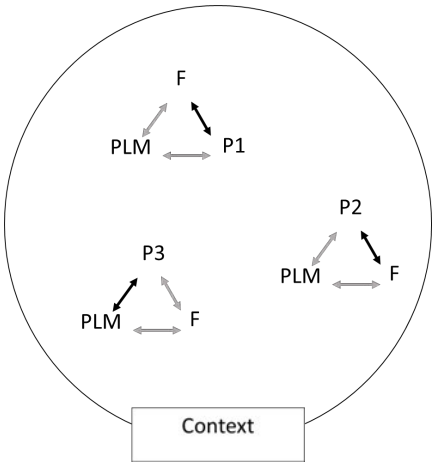
In Iteration 1, I explored the human relationships (both F-P and P-P) within Borko's model as I contemplated the evolution of my first design principle. Within this model, I acknowledged my own strong relationship with the PLM and I witnessed the growing P-PLM relationships. I participated in other self-regulation PL opportunities alongside participants and witnessed their experiences of learning about this topic from a variety of sources. As the iteration concluded, a comment made by Larissa, one of the video participants, pushed my thinking about the P-PLM relationship further. What became apparent was that human relationships were not the only kind of relationship supporting *how* participants developed self-regulation knowledge and skills. Larissa's relationship with the PLM was the driving relationship for her.

Relationships With the Learning Material

A quote often used in education is, "No significant learning can occur without a significant relationship" (Comer, n.d.). At first glance, this quote seemed to infer human relationships; however, upon further investigation, Cromer clarified that it referred to the relationship people have with learning material. This was significant as I considered the relationships F-P and P-PLM relationships within the iteration 1 video participant group. Isabel and Lynda spoke directly to how their relationship with me (F-P) underpinned their decision to partake in the video learning conversation PL component of the research. Larissa, on the other hand, shared that it was her relationship with the material (P-PLM) that was the catalyst for her involvement in the video component. These relationships are depicted in Figure 33.

Figure 33

Relationships With Facilitator and PL Material



The second design principle and its subsequent evolutions addressed aspects of the relationship participants had (or were establishing) with the learning material. In its initial wording DP2 sought to *ensure relevant and effective dissemination of knowledge and skills*. Having "worthwhile content" (Timperley, 2008, p. 10) and "subject matter that is worthy, relevant, and accessible" (Thompson et al., 2020, p. 88) was imperative. For participants in this research, the reason to engage in this learning was strongly supported by the stressors within their context. Coyle (2018) suggested establishing a purpose invited contemplation by asking: "What's this all for? What are we working towards?"(p. 178). The purpose for learning about self-regulation was to support stress management; this created the 'why' for participants. A participant with a strong 'why' was more likely to be successful in their learning (Sinek, 2009) and more likely to engage in a relationship with the learning material.

A strong P-PLM relationship suggested a shift away from "the delivery of some kind of information to teachers, [and towards] focusing on professional learning using approaches consistent with principles of how people learn" (Muijs et al., 2014, p. 249). As DP2 evolved to promote the building of a relationship with the learning material, the wording changed to reflect this. DP2+ evolved to state, 'Establish the 'why', personalise the 'what' and 'how', and negotiate the best 'when' and 'where' for PL within the boundaries of the context.' Muijs et al. highlighted the importance of teachers taking control of and responsibility for their own learning and personalisation of this learning was suggested by Thompson et al. (2020). Participants had agency to shape the content (what) and mode (how) of their PL through various avenues of collaboration, further fostering the building of a P-PLM relationship.

As I viewed DP2+ in terms of a P-PLM relationship, I reflected on Iteration 1 and identified many occasions where this relationship was established and maintained. Examples included my early classroom visits introducing Self-Reg concepts to teachers and their students, whole staff learning on Self-Reg theory connected to participants' lived experiences, other self-regulation PL opportunities, and collaborative planning with participants for PL content and mode. All these experiences supported relevant and effective P-PLM connections. Furthermore, participants who engaged in VLCs claimed an even deeper P-PLM connection.

The literature highlighted the affordances of using video in PL (Hollingsworth, 2005; Major & Watson, 2018; Marsh & Mitchell, 2014; Sherin & Han, 2004). Invitations to engage in VLCs gave further opportunities to personalise the learning and strengthen participants' relationships with material through the lens of their practice. In doing this, another relationship began to emerge: the relationship some participants were establishing or enhancing with their own self-regulation practice.

Relationships With Practice

The relationship some video participants developed with their self-regulation practice was another example of *how* teachers in this low socioeconomic primary school developed their self-regulation knowledge and skills. My engagement with the literature did not find the term 'relationship' used to describe what occured between an educator and their practice; however, I propose this as a fitting term. The online Merrian-Webster dictionary defined relationship referencing "the relation connecting or binding participants in a relationship" (n.d.). I drew from this concept of connection to further investigate teachers' relationship with practice. When searching for teachers' 'connection' to their practice, Fedders (2011) used this term as he described the effect of using video to self-monitor. Video provided both "windows and mirrors" (Berting, 2003, p. 144) enriching professional development. In my research, video was a powerful PL tool, affording participants a mirror – a way to see and connect with their practice, and a window for me as researcher and mentor – a way for me to see their self-regulation practice in context. For participants who engaged in multiple VLCs, evidence of a strengthening relationship with practice grew.

Participants' capacity to reflect and notice grew as they engaged in VLCs. These two capacities noted by Marsh and Mitchell (2014) were strengthened by viewing videos of personal practice. The in-the-moment stressors associated with teaching were removed as teachers became reflective observers of their own practice. Sherin and Han (2004) explained, when viewing video, "teachers do not have to respond immediately to the situation that they view. Thus unlike teaching, viewing classroom interactions via video can be time for reflection rather than action" (p. 165). Video reflected a personalised view of their own practice back to the participant while simultaneously providing me with a window to view their self-regulation practices.

Berting (2003) used this metaphor of “mirrors and windows” purporting the affordances of a digital interface; they suggested, “Digital interfaces are like mirrors in the sense that they reflect the user in context, including [their] physical surroundings, [their] immediate working or home environment, and the larger environment defined by [their] language and culture” (p. 74). Using video in PL also provided windows into others’ teaching practices.

The evolution of DP2 included personalisation of the ‘what’ and ‘how’ of the PL. Personalised video and VLCs played a key role in supporting participants to establish and develop a relationship with their self-regulation practice. It was a strong example of *how* participants learnt and applied self-regulation knowledge and skills. The qualities Earl and Timperley (2009) described as key to evidence-informed conversations were present: an inquiry habit of mind, relationships of respect and challenge, and the use of relevant [video] data. Video participant, Isabel, indicated that it was the combination of PL *and* the VLC that created the catalyst for her application of self-regulation knowledge and skills; without the video component, she admitted that application would not have happened. Larissa and Lynda also acknowledged the VLCs for their role in her application of self-regulation PL and Lynda shared that it changed her perception of her practice.

Watching video of oneself or others teach affects teachers cognitively, emotionally, and motivationally (Kleinknecht & Schneider, 2013). Sherin and Han (2004) described how teachers participating in video clubs shifted from a focus on the teacher to a focus on students. In my research, video participants shifted from a focus on themselves to a focus on their self-regulation practice. As this shift occurred and the relationship with practice strengthened, a willingness and curiosity to share practice emerged. Participants (both video and non-video) requested that the final PL session focus on the application of Self-Reg. Video participants agreed to share their videos and collaboratively annotate Self-Reg examples within their practice with their non-video engaged colleagues.

The first research question set out to further understand *how* teachers developed their self-regulation knowledge and skills. Through engaging with the literature and evolving my first two design principles, I came to understand that a

humanistic approach was needed to ascertain and respond to the learner's experience of energy and tension and enhance their capacity to engage in learning. Additionally, I recognised various significant relationships:

- relationships with people (connecting colleagues to colleagues, and colleagues to facilitators);
- relationships with the PL material (multiple sources); and,
- relationships with practice (one's own and others').

In the literature outside the field of teacher PL, the concept of "relationship learning" was explored by Selnes and Sallis (2003, p. 80) within customer-supplier relationships. Their theory drew similar themes to those mentioned earlier in this discussion, suggesting relationship learning can be promoted by "facilitating information exchange, developing common learning arenas, and updating behaviour accordingly" and by "cultivating a collaborative culture, formulating specific objectives for joint learning activities, and developing relational trust" (Selnes & Sallis, p. 80). I invite further consideration of the various relationships that teachers establish and develop as they engage in PL.

Research Question 2

The second research question was: What *enabled* and *constrained* teachers' application of self-regulation knowledge and skills? The literature highlighted the expectation for members of the teaching profession to engage in their own learning (Dall'Alba, 2009; Kwakman, 2003; Webster-Wright, 2009), suggesting that learning is best when it is situated and social in nature (Avalos, 2011; Borko, 2004; Darling-Hammond et al., 2017; Darling-Hammond et al., 2009; Kwakman, 2003; Timperley, 2008), and that the enactment and reflection on PL provided the catalyst for professional growth and change (Clarke & Hollingsworth, 2002; Thompson et al., 2020). Various theories of learning suggested in the literature and in the literature review, included adult learning theory (Kwakman, 2003), social constructivism and constructionism (Young & Collin, 2004), situated learning theory (Avalos, 2011; Lave & Wenger, 1991) and contemporary learning theory (Clarke & Hollingsworth, 2002). By considering teacher PL through adult learning theory and stress theory, Kwakman (2003) claimed, "stress theory provides a challenging perspective on teacher

development as it proposes a model in which stress and learning are conceptually related" (p. 155). Timperley (2008) also suggested PL involved risk (a stressor) as teachers integrated theory and practice.

My research also connects stress and learning conceptually as I examined factors that enabled and constrained application of self-regulation knowledge and skills. To learn and grow, stress is necessary; however, when stress is excessive, ongoing, or not managed, the capacity to learn is reduced (Dykema, 2006; Shanker, 2013; Shanker & Hopkins, 2020). These enabling and constraining factors, the affordances and consequences of energy and tension states, the literature, and the evolution of DP3 (application) and DP4 (feedback) gave further insight into what supported and hindered teachers in this low socioeconomic primary school to apply their self-regulation learning.

As the research commenced, DP3 and DP4 provided the foundation for application and feedback as essential PL principles. DP3 centred on the frequent application of self-regulation learning across various contexts and DP4 considered engagement in feedback with others. Over the course of the research, participants reported both an increase in frequency and a greater diversity of demographic application. They were more aware of applying their learning and described this happening in both work and non-work contexts. Engagement in feedback with others did not appear in the data in the first iteration, rather, it became evident through VLCs. In fact, Mike claimed that his key motivation to engage in VLCs was to receive feedback. In summary, participants reported many factors that enabled and constrained application of self-regulation knowledge and skills across the research (see Table 27).

Table 27

Factors Enabling and Constraining Application of Self-Regulation Knowledge and Skills

Enabling factors	Constraining factors
VLCs	Workload
Mentorship	Other dysregulated people
Group discussion	Context
Observing others	Inability to focus
Observing self on video	Unpredictability
Completing energy and tension snapshot	Exhaustion
Time for reflection	Intense stress
	Demands
	Personal health
	Prosocial stress (worry and concern for others)
	Lack of social engagement
	Inconsistent support

Kwakman's (2003) research offered a model of PL activity where personal, task, and work environment factors were considered as enabling or constraining participation in PL activity (see Figure 9). Of these three factors, personal factors (including professional attitudes, appraisals of feasibility, appraisals of meaningfulness, emotional exhaustion, and loss of personal accomplishment) were observed to affect task and work environment factors (p. 167). A review of the factors reported by participants in this research as constraining application of PL depicted stressors in the biological domain (personal health, exhaustion), emotion domain (intense stress), cognitive domain (inability to focus, demands, workload), social domain (other dysregulated people), and prosocial domain (worry and concern for others). Shanker and Barker (2016) explained,

> Any stressor in any domain can trigger a stress cycle, but a [person] is most vulnerable when in a low-energy/high tension state. Once a stress cycle is tripped, the threshold drops for a stress response in any of the other domains. (p. 82)

Participants experiencing these stressors and the resulting energy/tension state had a significantly reduced capacity to apply self-regulation PL. Their psychophysiological response to stress manifested in physical responses (for example,

increased heart rate, an inability to think clearly, muscle tension), hypervigilance, and heightened stress reactivity - all states that significantly diminished their capacity to apply learning.

In an interview with Dykema (2006), Porges explained how, “social engagement behaviours… require that we give up our hypervigilance” (p. 32) and described the role environments play in supporting the perception of safety. This hypervigilance also interfered with the capacity for social engagement, a key attribute to effective PL (Avalos, 2011; Davey & Ham, 2010; Timperley, 2008, 2011). The hypervigilant states of highly stressed participants constrained their enactment of self-regulation knowledge and skills as well as their engagement in reflective PL opportunities. This was evident in the integrated PL and questionnaire Iteration 3 findings where participants regarded sharing practice, receiving feedback, and engaging in group discussions as highly important, yet when these opportunities were available, they did not always take them up. Some cited low energy/high tension states while others shared that prosocial stressors, including lack of confidence, shyness, or feeling left out justified their choice not to opt in. This supported the claims Kwakman (2003) made demonstrating that personal stressors potentially constrained participants’ engagement in PL opportunities.

Factors that enabled application of self-regulation knowledge and skills fell into two categories. The first involved social engagement: VLCs, mentorships, group discussion, and the observation of others. The second involved personal reflection: observing self on video, completing the energy and tension snapshot, and time for reflection. The capacity to engage socially and reflect suggested a balance of energy and tension and a participant’s perception of safety across the 5 domains. A safe physical learning environment (biological domain), safe professional relationships (emotion, social, and prosocial domains), safe relationship with the learning material (cognitive domain) and safe relationship with practice (cognitive and prosocial domains) supported the application of self-regulation knowledge and skills.

VLCs depended on this social engagement and perception of safety and fostered relationships between people, the learning material, and practice, through the conversations that used the mirrors and windows they provided. According to Earl

and Timperley (2008) the qualities of a productive evidence-informed learning conversations included relationships of respect and challenge, using relevant data, and an inquiry habit of mind (p. 3). Each of these qualities aligned with the relationships recognised through the evolution of DP1 (relationships with people, material, and practice). The context-specific humanistic lens used to evolve all DPs, fostered the perception of safety, and set the stage for VLCs with these qualities to occur. Data from VLC participants gave evidence to the rich learning these conversations inspired.

The affordances of using video in teacher PL are well documented within the literature (Hollingsworth, 2005; Marsh & Mitchell, 2014; Tripp & Rich, 2012; Zhang et al., 2011) yet evidence of teacher aversion to being videoed can also be found (Dickerson et al., 2007; Kleinknecht & Schneider, 2013; Zhang et al., 2011). This research concurs with both claims. In the initial iteration, Larissa enthusiastically volunteered for the video and VLC option, while Isabel and Lynda were more hesitant, describing their familiar relationship with me as the reason they were willing to engage. Larissa was very curious about the topic of self-regulation and the prospect of witnessing this in her own practice intrinsically motivated her. My relationship with participants was characterised by respect and challenge. These qualities were highlighted by Earl and Timperley (2008) as important within learning conversations. Rich discussion and social construction of understanding of self-regulation knowledge and skills resulted. It was interesting to note that most participants felt an increase in tension at the prospect of being videoed, yet experienced surges in energy, less tension, a sense of reassurance, and increased confidence after engaging in this process.

Although 27 participants opted not to be videoed in iteration 1, over the next two iterations, participants continued to develop their relationships with me, their colleagues, and the material. They also witnessed video participants develop a relationship with their self-regulation practice through the VLCs. My efforts to build trusting relationships and to cue safety through using a humanistic approach, in combination with the enthusiastic promotion of the VLCs by video participants, lead to increased video engagement. More participants perceived safety in these

relationships, enabling further engagement in PL. At the conclusion of the research, nine participants were interested in engaging in VLCs.

Video footage provided relevant and personalised data for the VLCs as it related "directly to the context in which improvement [was] sought" (Earl & Timperley, 2008, p. 6). Video also enabled multiple viewings to consider various perspectives and practices (Hollingsworth, 2005; Zhang et al., 2011). Timperley (2008) suggested that "teachers need multiple opportunities to absorb new information and translate it into practice. Learning is cyclical rather than linear, so teachers need to be able to revisit partially understood ideas as they try them out in their everyday contexts" (p. 15). Multiple viewing and annotation of the video samples engaged teachers in developing their relationship with their self-regulation (and co-regulation) practices. Being a witness to their own practices gave them the opportunity to see, discuss, and frame what they saw as self-regulation and co-regulation, supporting increased self-awareness and a deeper connection to the PL.

Viewing video collaboratively further enriched the learning and developed the capacity for reflection (Marsh & Mitchell, 2014). It provided an opportunity for "teachers to engage in discussions in which individuals were transacting between what they saw and heard on the screen and abstract pedagogic principles, contextualising and decontextualising and linking theory to observed classroom practices" (Marsh & Mitchell, p. 406). I facilitated these conversations bringing my knowledge and expertise of self-regulation and supported participants to "develop the theoretical understandings and tools [to] enable [participants] to take a self-regulated, inquiry approach to their everyday practice" (Timperley, 2008, p. 21). Through these VLCs, participants developed an "inquiry habit of mind"(Earl & Timperley, 2009, p. 3); their capacity to "notice" (Marsh & Mitchell, p. 408) and reflect increased their recognition of their own self-regulation practices, enhancing self-awareness. They were able to "see" self-regulation and "frame" it as such.

Many participants in this study chose not to engage in the video component of this research. Stressors associated with being videoed and discussing Self-Reg theory in practice hindered some participants. Dickerson et al. (2007) shared various reasons teachers in their research provided for not being videoed including: how time-

consuming it was, feeling self-conscious about appearance and speech, witnessing teaching imperfections, technical complications, competing investigation priorities, and the distractions it caused in the classroom. All of these reasons, except technical complications, were found within my data. For some, adding the VLC component added more stress to the already very stressful nature of their work. Curiosity to learn from others' videos was high amongst the non-video participant group and this was met by growing confidence from video participants to share their videos with others. This resulted in videos being shared in the final PL session focused on application, reported by all participants as mutually beneficial.

Kleinknecht and Schneider (2013) noted that "emotional-motivational involvement" was higher for those who observed others' videos and that they were "more deeply engaged in analysis of problematic events" (p. 13). The process of collaboratively annotating a colleague's video further enriched the learning for all. Video participants were surprised at their non-video collaborators' capacity to find examples of self-regulation that they had not yet noticed suggesting legitimate peripheral participation within the situated learning opportunity (Lave & Wenger, 1991). The positive experience of sharing videos in the final PL session fostered relationships with people, material, and practice, and contributed to the feeling of safety within the learning environment.

In summary, what constrained participants' application of self-regulation knowledge and skills were compounding stressors, resulting in energy and tension levels unconducive to learning and brain/body responses designed to activate a stress response rather than engage the prefrontal cortex in learning. Essential to activating the capacity to learn was an environment that cued safety: safety in relationships with people, the learning material, and practice. The capacity to engage socially enabled the application of self-regulation knowledge and skills and engagement in formal feedback. Through the cycles of iterations, various aspects of the self-regulation PL appeared and reappeared, shaping participants' unique learning trajectories. Aspects developed included participants' capacity to justify why this learning was important, notice their own energy and tension and make adjustments through growth-promoting strategies, engage with the learning, "see it" in their practice, "frame it" as

self-regulation, consciously apply the learning, and reflect on in it. By repeating personalised combinations of these aspects over three iterations, fluency in practice evolved and the capacity to be reflexive grew, manifesting in the embodiment of the self-regulation learning where the focus extended beyond the PL of knowledge and skills towards "learning professional ways of being" (Dall'Alba, 2009).

Research Question 3

The final research question was: How does the learning and application of self-regulation knowledge and skills influence how teachers manage stress? Research on the influence of self-regulation PL on teachers' management of their own stress was challenging to find. Justifying the importance of this research were claims of the relationship between teachers' social/emotional competence and wellbeing and student and classroom outcomes (Jennings & Greenberg, 2009; Spilt et al., 2011) and the effects of PL on the neuroscience of challenging behaviour on educators' beliefs, practices and perceptions (Lisinski, 2022; Rosati, 2020). My research shone a spotlight directly on the influence that self-regulation PL had on teachers in a low socioeconomic primary school supporting their management of stress.

In response to this final question, I focus on the journeys of participants who were highly involved in the PL, VLCs, group discussions, and questionnaires. The evolving practices of these participants afforded by iterative cycles of "enaction and reflection" (Clarke & Hollingsworth, 2002, p. 954) enabled growth and change in their awareness, mindset, and actions which resulted in improved stress management.

Growth and Change in Awareness to Support Stress Management

Research by Schussler et al. (2016) found that teachers who increased their self-awareness through mindfulness PL experienced reduced emotional reactivity and improved wellbeing and capacity to manage stress. Similarly, in my research, increased self-awareness prompted through self-regulation PL also reduced emotional reactivity, improved wellbeing, and supported stress management. Participants described increased self-awareness in five different areas: their brain/body response to stress, their own stress behaviour, various energy-tension states, maladaptive and growth-promoting self-regulation strategies, and opportunities to restore. All of these contributed to improved stress management.

Rosati (2020) described a shift in beliefs and practices of educators who increased their awareness of the "recent neuroscience findings that explain behaviour as the result of the nervous system's adaptive response to stressors" (p. 1). In their VLCs, Isabel and Mike both articulated their knowledge of what happens within the brain when a student is dysregulated with Isabel emphasising, "they are not *choosing* to act this way." This increased awareness of the psychophysiological responses to stress supported stress management as it inspired participants to respond in ways that reduced stress (seeking to bring calm to a child) rather than escalated stress (raising the voice, isolating the child, punishing the child). An example of this was Isabel's increased awareness of the neuroscience which led to offering a frequently dysregulated student restoration through sleep when she noticed signs of early signs of dysregulation occurring. This addressed the child's energy needs and lowered his tension, meaning that an outburst was avoided, and evacuation of the class was not needed, significantly reducing Isabel's stress.

Self-awareness of personal stress responses also improved stress management. Ursin and Eriksen (2004) describe a stress response as "a general alarm in a homeostatic system, producing general and unspecific neurophysiological activation from one level of arousal to more arousal" (p. 567). Participants with increased awareness of their own arousal states and the behaviours that resulted showed greater insight into stress management. Mike and Larissa shared awareness of physical sensations of muscle tension and increased heart rate and Lynda shared, "I have become aware of what my actions are when I am dysregulated and regulated. I am in tune with how I am feeling and why I am not regulated."

Maladaptive modes of self-regulation are described by Shanker (2020) as modes "that provide short term relief but lead to greater stress down the road" (p. 22). Participants increased their self-awareness of the various modes of self-regulation they employed to manage stress. They were able to distinguish between maladaptive and growth-promoting modes. One participant shared, "Before, I would go home and have a drink to destress, now I go for a walk." Larissa described her growth-promoting strategies, "Now I am willing to put my mental health first, I employ strategies when I am not coping, like yoga, meditation, and I plan long weekends. I took two days in the

middle of the term to break it up." Having the self-awareness to distinguish between maladaptive and growth-promoting strategies resulted in improved stress management.

Increased self-awareness of energy and tension also supported participants to manage stress. Using the energy and tension snapshot increased participants' ability to notice energy and tension (Thayer, 1996; Thayer, 2003) across the 5 domains and supported them in applying actions that addressed these. At its extreme, consistent low energy and high tension resulted in outbursts (as witnessed when Mike was being poked by students), mental health sick days (Isabel, Larissa, and Beth), and Larissa's decision to leave the school altogether.

A catalyst for teacher burnout is work stress and poor recovery (Gluschkoff et al., 2016). Increasing self-awareness for opportunities to restore energy supported stress management. Isabel, Larissa, and Lynda all commented on a raised awareness of opportunities to restore within their busy teaching environments and how these provided micro-moments of restoration. Other participants shared, "Before I used to take work home, now the laptop only comes home on the weekend" and "Before I would spend hours planning and staying up late, now I dedicate my time to ensure I am calm, like TV and meditation."

Growth and Change in Mindset to Support Stress Management

Changes in mindset supported stress management amongst highly involved participants. Bellert and Graham (2013) promoted the importance for teachers to learn "neurofacts" and be aware of "neuromyths" (p. 7) and Ng (2018) reported the mindset shifts that came from teachers who engaged in neuroscientific learning. Whiting et al. (2021) acknowledged the rapid development in teacher awareness "of how stress affects primary school children's attention and learning" (p. 177) and suggested "raising teachers' awareness of pupils' differing stress responses will be an important step in accommodating the differing needs of children in their classrooms" (p. 177). In this research, highly involved participants learnt the neuroscience behind Self-Reg and applied this knowledge in personalised contexts. This shifted participants' mindsets about students, dysregulated behaviour, and effective approaches to respond to dysregulated behaviour.

Shanker's (2019) quote, "See a child differently and you'll see a different child," described the mindset shift that occurred for highly involved participants. Dysregulated behaviour seen as 'bad' or 'naughty' was more likely to be responded to through punishment, isolation, or reprimand, increasing stress for both the student and the teacher. In Iteration 1, Lynda described her perception of students deliberately "trying to upset" and "doing [things] to [her] and making [her] react." She saw students' dysregulated behaviour as a personal attack and increased her vigilance and desire to control. Over the subsequent iterations this shifted as she reframed their dysregulated behaviour as stress behaviour and became aware of her own signs of rising stressors and how her own behaviour changed. By seeing a child's dysregulation as stress-based, her body language changed: "facial expression, eye gaze, tone of voice, gestures, posture all soften as a result of [the] aspect shift" (Shanker, 2019). At the end of Iteration 3, she unapologetically vowed to put herself first, knowing that if she could be well regulated that would be the best for her students too. Research by Rockel and Fryer (2016) advocated for teachers to prioritise this learning as they stated, "Self-regulation focuses on how a teacher has the chance to deeply reflect on his or her own level of emotional functioning in order to explore strategies which will support children as they develop competencies to face the stressors that daily living and learning brings" (p. 72).

Beth observed the dramatic shift in behaviour for a highly dysregulated student when he was moved into a new living situation. She too had reported viewing student dysregulation as deliberate misbehaviour. Her observations of the transformational changes in behaviour for her student when his stressors had been lowered allowed her to 'see the different child' and understand the influence of stress on his behaviour and inability to attend to the learning and social expectations of the classroom (Whiting et al., 2021). Beth described the change she saw in this student as "magical" and "incredible," "like having a new child in the class" and these changes, in turn, reduced Beth's stress.

Rosati (2020) claimed a two-day Self-Reg PL intervention was associated with changes in how educators thought and acted. This was also evident in my research. All highly involved participants saw changes in mindset. They grew in their capacity to

reframe behaviour from misbehaviour to stress behaviour. This “aspect shift” (Shanker, 2019, p. 1) resulted in a change of action as they responded to soothe the dysregulation bringing calm to the situation rather than further escalating it. This influenced their own stress management as it reduced the time students spent in a dysregulated state. New mindsights enabled participants to see students differently, reframe behaviour, and remain calm as they responded to, rather than reacted to, dysregulation.

Growth and Change in Actions to Support Stress Management

Participants’ management of stress was influenced by their self-regulation PL due to the changes this inspired in their actions. These changes saw an increase in how participants prioritised their own self-regulation and restoration, recognised and applied growth-promoting self-regulation strategies, noticed and applied practices that supported co-regulation, and worked to remain calm in escalated situations to be less reactive and more responsive to others’ needs. Each of these actions lead to reducing stressors and supporting stress management.

Research on teacher PL strongly suggested learning to be centred on student outcomes (DuFour, 2004; Timperley, 2008), yet when it comes to PL about self-regulation, I argue that it is teacher outcomes that should be prioritised. Rockel and Fryer (2016) used the metaphor of putting one’s own oxygen mask on before assisting others, to underscore the importance of educators prioritising their own learning about and application of self-regulation. Jennings et al. (2021) also described the many affordances that the social/emotional competence and wellbeing of teachers result in for students and school communities. Their research recognised that “a teacher’s overall wellbeing and efficacy as well as factors such as friendships, marital relations, and degrees of life stress in a teacher’s personal life might also affect the performance of social and emotional abilities in the classroom” (p. 494), something also noted in my research.

The participants in my research found it challenging to prioritise themselves in their learning. Christine admitted, “I already had a strong understanding of Self-Reg and worked hard to help students to build this but hadn’t thought towards that next step of applying it to myself.” Over the course of the research, highly involved

participants began shifting the focus from their students to their own self-regulation learning, recognising this as a prerequisite to improved student outcomes. Mike commented, “I’m more aware of what self-regulation is and how I can regulate in the class – myself and students,” and Isabel noticed her capacity to apply the 5 steps on herself had improved while she continued to apply the 5 domains more to support coregulating students.

The very challenging nature of this context also resulted in extreme actions to manage stress. Larissa chose to leave the school indicating that if she didn’t, she would no longer continue in the teaching profession. Simon and Moore Johnson (2015) investigated why teachers leave high poverty schools and concluded it was not the students they were escaping, rather the social nature of the working conditions, such as “school leadership, collegial relationships, and elements of school culture” (p. 1). Larissa had a passion for learning about and applying self-regulation. Research by Tatar (2009) categorised teacher coping strategies into three broad realms and Larissa actively employed two: “individual coping strategies” (personal mediation, affirmations, yoga, quiet time in her office) and “group-mediated coping strategies” (organisation of group self-regulation opportunities for colleagues, her involvement in this research). It was the third realm, “turning for help”, in this case professional help, that Larissa believed should have been automatically provided by the Education Department for educators in this context. She recognised that it was often difficult to turn to a colleague or leader for help as they too were under intense stress. In her final VLC, Larissa advocated strongly for regular counselling for herself and her colleagues to help them process the trauma associated with their work. She felt that there was a lack of understanding about the realities of working within this context from the Department of Education and what they should offer to educators in challenging school contexts like this one.

Shanker (2020) explained how our bodies can respond to stressors “provided we don’t feel helpless” (p. 166). He described how an inability to escape stressors can impair “the ability to think, speak, feel, and even move [and lead to] maladaptive modes of self-regulation” (p. 166). One participant wrote about a change of action, indicating a sense of helplessness. “Before I took on too much, worried too much, and

compared myself too much, now I (guilt shared) do the minimum, I am in survival mode, I prioritise my day off (golf)." These acts of "survival" indicated the challenges of managing the intense stressors in this context and a reduced capacity to be an effective educator.

Kyriacou (2001) suggested two modes of coping employed by teachers who were stressed: "palliative and direct action" (p. 30). Tatar (2009) described the maladaptive features of palliative modes such as "excessive drinking, smoking and avoidance behaviours" (p. 401) as they temporarily reduced stressors and also potentiated negative downstream consequences. Direct action modes of coping (upskilling, organisation, negotiating with colleagues) promoted growth without the negative consequences. Participants developed the capacity to distinguish between maladaptive and growth-promoting self-regulation strategies, recognise when and where they applied these strategies, and reflected on changes in actions. One participant shared, "Before I would go home and not have anything planned, now I go to the gym, cook, walk, listen to music or podcasts on my headphones." Some participants recognised how they were using food or alcohol to reduce stress and described changes to these habits resulting from the PL. They also increased their ability to recognise the maladaptive and growth-promoting self-regulation strategies used by students.

Participants noticed their own practices and habits that potentiated student dysregulation and enacted change which supported stress management. Mike became aware of ways his voice dysregulated some learners, yet supported others, enabling him to adjust how he spoke to different students. His loud deep voice reduced stressors for a student with impaired hearing whilst it dysregulated others. Most highly involved participants highlighted changes in routine as very dysregulating for students and adjusted their practices to provide as much notice of changes to schedules and activities as possible. Teacher organisation was also noted as a practice that supported effective stress management.

Research by Clunies-Ross et al. (2008) "revealed that the use of predominantly reactive management strategies has a significant relationship with elevated teacher stress and decreased student on-task behaviour" (p. 693). Participants in this research

demonstrated changes in their capacity to remain calm and choose their actions carefully. For some, their time of tolerance increased, “Now I take longer to escalate when annoyed, verbally assaulted, [or a] student is refusing to follow instructions.” Many suggested they used to be quick to raise their voice in frustration and anger; however, now one participant reported, “I make a conscious effort to keep calm and ignore minor behaviours, share strategies with students to build [their] toolkit,” and another shared “now I really think and act only when necessary, try to be calm, use a soft voice, not get upset.”

The influence of self-regulation PL for highly involved participants was evidenced through growth and change in their awareness, mindset, and actions. Findings evidenced change that went beyond the mere ‘application of self-regulation knowledge and skills to support stress management’ that this research set out to explore. Highly involved participants showed they were “develop[ing] professional ways of being where the focus [was] becoming, not simply knowing as an end in itself” (Dall’Alba, 2009, p. 34). These participants were engaged in sense-making and taking up opportunities to “change their identities as learners” (Anderson et al., 2018, p. 1). Geijsel and Meijers (2005) explained, “Identity learning involves a relation between social-cognitive construction of new meaning and individual, emotional sense-making of new experiences” (p. 419). Emotion is a critical ingredient to identity learning and often involves stress through fear and uncertainty for the learner brought about by “boundary experiences” (Geijsel & Meijers, p. 424). Participants in this research were confronted by these boundary experiences and engaged in discourse in a social environment (through VLCs and collaborative video annotating with colleagues) to make meaning of them resulting in “ mutual understanding and shared values” (Geijsel & Meijers, p. 425) which supported educational change.

Aspects of PL Trajectories

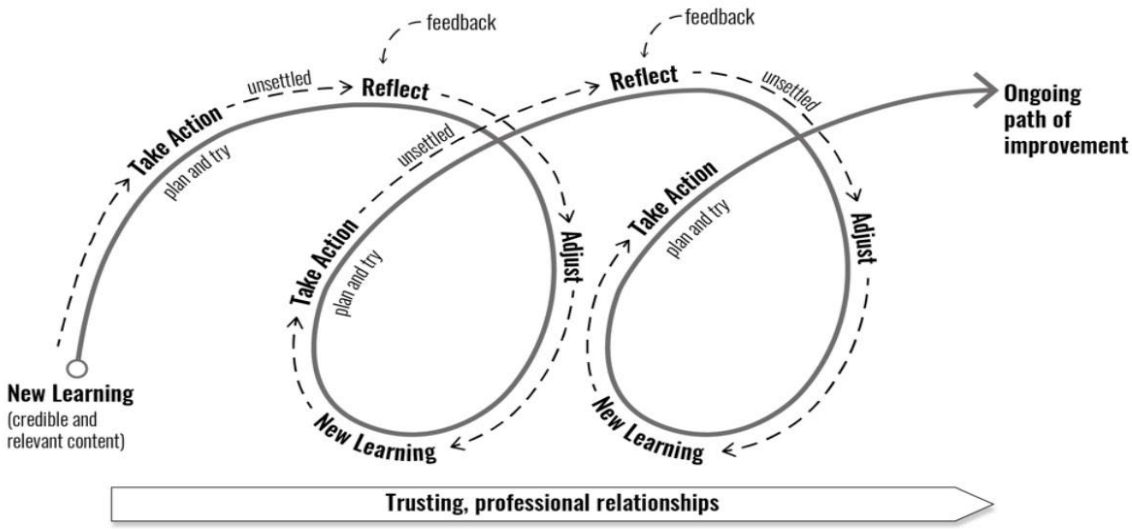
There are many models attempting to capture effective teacher PL (Borko, 2004; Clarke & Hollingsworth, 2002; Thompson et al., 2020; Timperley, 2008). In this research, I witnessed teachers learning and changing through growth in their relationships with people, relationships with the PL material, relationships with their own practice, and relationship with their own professional identity. Teacher PL was

not mechanical, nor linear; on the contrary, it was messy, iterative, confronting, and highly dependent upon the participants' energy and tension state and their capacity for social engagement.

The Iterative Model of PL presented by Thompson et al. (2020) closely depicted what occurred for highly involved participants in this research. This model was shared previously as Figure 11.

Figure 11

Thompson et al.'s (2020) Iterative Model of PL



My research supported the key features of this model, its iterations, cycles of credible and relevant learning and application, times of feeling unsettled through boundary experiences (Geijsel & Meijers, 2005; Mesker et al., 2018), reflection and feedback from social engagement, and adjustment of practice for change, growth, and improvement. My research also added to this model suggesting that participants needed a strong personal justification to engage in the learning, they needed to be in an energy-tension state conductive to learning and social engagement, so that relationships with others, the learning material, their practice can grow, resulting in a shift in their professional identity (Dall'Alba, 2009; Geijsel & Meijers, 2005).

To summarise, the catalysts for effective teacher PL on self-regulation to support stress management noted within this research outlined key aspects that enabled a "range of possible development trajectories" (Dall'Alba, 2009, p. 43).

Although these may appear linear in this text, the ways these played out was unique for each participant and more in line with the Iterative Model of Professional Learning (IMPL) (Thompson et al., 2020). No participant stepped neatly from one aspect to the next, rather they each experienced the unfolding of their own journey with personalised "boundary experiences" made possible "when social construction and individual sense-making become closely related to each other" (Geijsel & Meijers, 2005, p. 420).

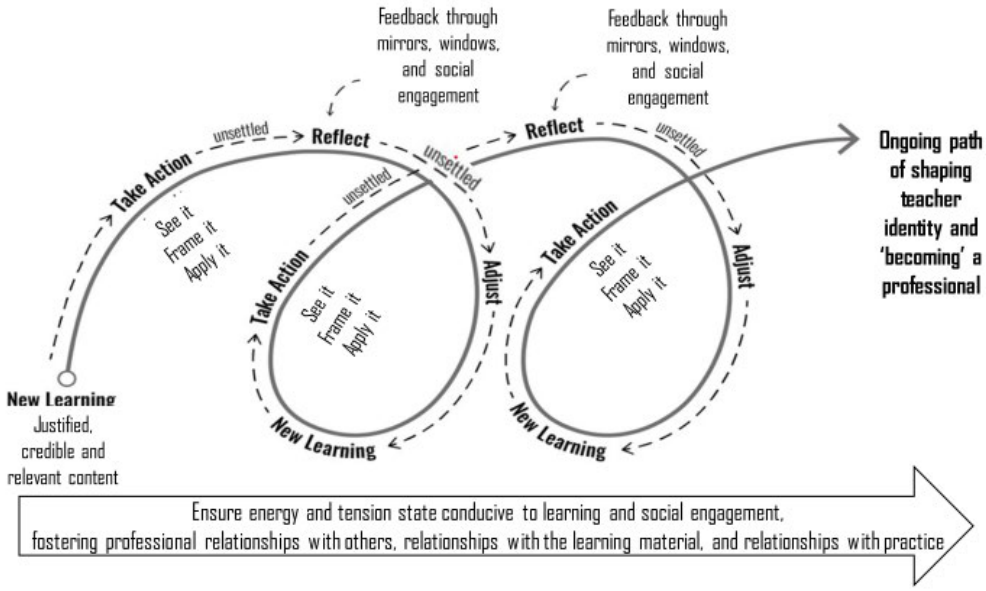
In the following summary of these aspects, "it" refers to Self-Reg learning/ noticing/ applying:

- Justify it: *Why* is learning Self-Reg to support stress management important?
- Prepare for it: Check in with energy and tension and restore enough balance to be ready to justify it, learn it, see it, frame it, apply it, reflect on it, and repeat it
- Engage with it: Participate in a variety of self-regulation PL opportunities (Self-Reg, Neurosequential Model, Zones of Regulation), socially engage with others to make sense and meaning of it
- See it: Notice Self-Reg moments in action within real contexts
- Frame it: Describe what is noticed in Self-Reg terms
- Apply it: Put Self-Reg into action (either through reflection or enactment)
- Reflect on it: Contemplate what was noticed when Self-Reg was or was not applied individually and through social construction, consider boundary experiences, and future implications.
- Repeat it: Take up opportunities to engage in the above aspects to create fluency
- Become it: "Learning to become a professional involves not only what we know and can do, but also who we are (becoming)" (Dall'Alba, 2009, p. 34).

  I applied these PL aspects to the IMPL (Thompson et al., 2020) (see Figure 34).

Figure 34

Edwards' Adaptation of Thompson et al.'s (2020) IMPL



Chapter 7 Summary

In this discussion chapter, I addressed the three research questions using the data-informed and literature-informed evolved DPs. I shared a professional learning trajectory model, drawing from the literature and building on the model suggested by Thompson et al. (2020). This gave insight into *how* teachers within this challenging context developed their self-regulation knowledge and skills, including how some highly involved participants showed signs of embodied learning as they enacted "professional ways of being, where the focus is becoming, not simply knowing as an end in itself" (Dall'Alba, 2009, p. 34). I listed factors that enabled and constrained participants' engagement in and application of self-regulation PL and gave evidence of growth and change in participants' awareness, mindset, and action that all supported improvement in stress management. I highlighted the affordances of personalised video to support PL, noting that both videoed and non-videoed participants benefited. Participants who engaged in the video component of the research demonstrated the powerful learning stemming from the combination of PL, followed by video, followed by mentorship through VLCs and the boundary experiences this provided. The reductive effects of teachers' allostatic overload on their capacity to engage in

meaningful learning underscored the need for PL providers to use a humanistic approach when supporting the professional growth and change of teachers in challenging contexts. This research also demonstrated the maladaptive and growth promoting strategies employed by teachers to manage stress and the various outcomes that result (for example, remaining at the school burnt out in survival mode, applying self-regulation to tackle each day as it comes, and leaving the school to enable continuation in the teaching profession)

In the following chapter, I present the conclusions from this research by summarising the scientific, practical, and societal outputs (Herrington et al., 2007) resulting from this DBR investigation. I identify implications for theory, research methods, policy, and practice, and outline the limitations of this project and suggest future research opportunities.

Chapter 8: Conclusions

This research confirmed well-established views within the literature that teaching is a stressful profession. It showcased the significant stressors faced by teachers in a regional low socioeconomic context, providing details of the stressors faced (over and above regular teaching and learning responsibilities) in this challenging context. Addressing a gap in the literature, it examined *how* these teachers learned to understand and manage stress through PL founded on Self-Reg theory and what *enabled* and *constrained* their application of the learning. This learning was messy, iterative, personal, ongoing, and dependent on participants' capacity to be in a state conducive to their own learning. As a result, this research described: the unique and varied histories teachers brought to the learning; their justifications for why this learning was important; their preparation for learning to ensure an appropriate balance of energy and tension was available for the unsettling stress of learning; and, their enactment of the learning through seeing it, framing it, applying it, reflecting on it, and engaging with others (and video) to receive feedback on it.

This research highlighted participants' proclivity for prioritising student wellbeing needs over their own. For most highly involved participants, an epiphany occurred as they realised the importance of their own self-regulation and stress management as foundational to their capacity to be there for others. It also highlighted that there are no 'quick fixes' to the significant stressors faced by teachers in challenging contexts and how teachers often leave these contexts as a strategy to stay well or remain in the profession (in a less stressful context). This research demonstrated the importance of teachers' understanding of the psychophysiology behind the brain/body response to stress as well as a process to respond and manage stress to support their own wellbeing as well as positive outcomes for their students. Self-Reg theory was foundational to this learning.

This research provided many insights and invites further questions. Therefore, to frame the concluding chapter of this thesis, the following aspects are addressed:

- DBR outputs;

- Implications;
- Limitations;
- Further research opportunities; and,
- A closing statement.

DBR Outputs

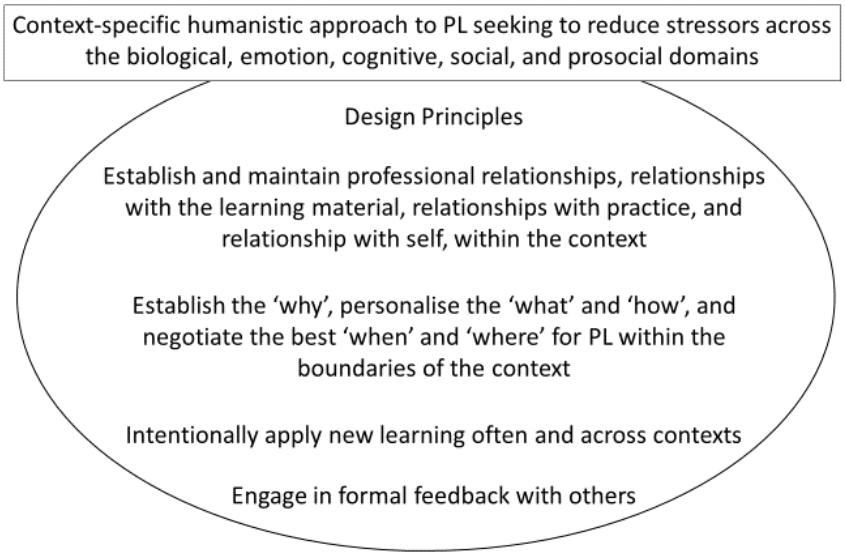
DBR methodology used in this research resulted in scientific, practical, and societal outputs (Herrington et al., 2007) to "provid[e] theoretical contributions and practical solutions" (Crippen & Brown, 2018, p. 490) to the problem identified by the participants and researcher as high teacher stress. This DBR investigation produced outputs within each of these three categories. In the following section, scientific, practical, and societal outputs are shared and suggested for others seeking to engage in self-regulation PL in similar contexts.

Scientific Outputs

Herrington et al. (2007) suggested design principles were scientific outputs from DBR investigations that "contain substantive and procedural knowledge with comprehensive and accurate portrayal of the procedures, results and context" (p. 4095). Using a pragmatist and constructivist approach and through engagement with the literature and the findings from three iterations, I evolved four design principles. In the final iteration, I also employed a humanistic approach to these principles. These are represented in Figure 35 and serve the purpose of providing a lens and approach for others seeking to engage in self-regulation PL within similar contexts.

Figure 35

Evolved DPs Recommended for Teacher Self-Regulation PL in High Stress Contexts



By recognising and responding to the energy and tension needs of teachers and leaders working in extremely challenging contexts through a 5 domain approach, PL providers can support teaching professionals to develop self-regulation knowledge and skills to improve stress management.

Practical Outputs

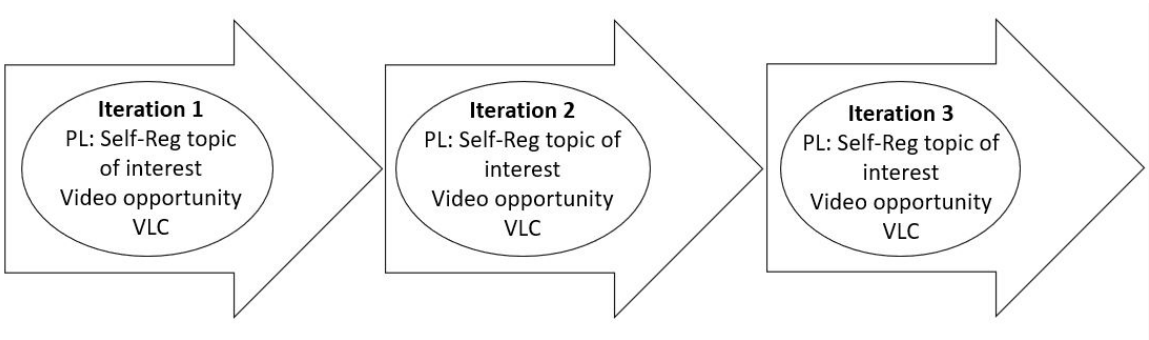
The design principles and humanistic approach outlined in the preceding scientific output section apply to the practical outputs. According to Herrington et al. (2007), artefacts are the practical outputs from DBR. In this research, there were six artefacts: four models and two tools. I created one model (Model 1), adapted two pre-existing models (Models 2 and 3), and confirmed the affordances of an existing model (Model 4). I also designed and tested one tool (Tool 1) and confirmed the affordances of another tool (Tool 2) used within the research. These models and tools, in combination with the DPs and humanistic approach, are suggested as a starting point for professionals seeking to learn, apply, and embody self-regulation knowledge and skills.

Model 1: PL, Video, and VLC cycles

The first model, resulting from DBR's iterative approach and aligning with principles of effective PL, was the *Iterative PL, Video, and VLC* model (see Figure 36).

Figure 36

Iterative PL, Video, and VLC Model



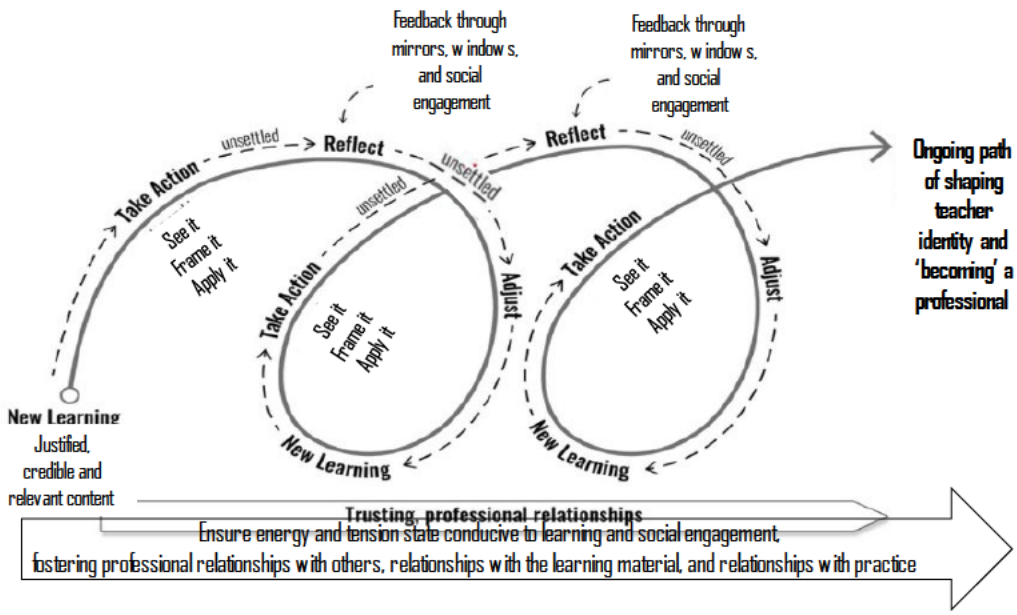
In this model, the four DPs and humanistic lens were applied to iterative cycles of PL, video opportunities, and VLCs. The model suggests self-regulation PL based on participants' self-regulation needs and curiosities and presented through the lens of Self-Reg theory, followed by opportunities to be videoed and engage in a VLC. The video and VLC provide a personalised starting point for reflection and professional dialogue, connecting theory to practice.

Model 2: Iterative Professional Learning Trajectories Model

The second practical output from this DBR investigation was the *Iterative Professional Learning Trajectories Model*, built on the model proposed by Thompson et al. (2020). The enhanced model incorporated the DPs and the PL trajectories noted in the discussion chapter. This model suggests (but does not determine in a fixed way) potential iterative learning trajectories that are characterised by a learners' capacity to: justify, prepare for (in an energy and tension way), engage with, see, frame, apply, reflect on, and repeat the learning, resulting in embodied enactment of learning that "develop[s] professional ways of being" (Dall'Alba, 2009, p. 34). It also highlights the experience of discomfort expected in learning as a learner is unsettled by the homeostatic disruption inherent with new learning, enactment, and reflection. Previously shared, Figure 34 overlays the findings from my research onto Thompson et al.'s model.

Figure 34

Edwards' Adaptation of Thompson et al.'s (2020) IMPL



Model 3: VIPP-Teacher Professional Learning

I adapted Juffer's (1993) *Video Intervention for Positive Parenting* (VIPP) model as an approach and structure to support teacher PL through VLCs (see Chapter 3 for details). With previous adaptations in other contexts and for other groups (see Chapter 3 for more details); this research applied VIPP in a new way, to teacher PL. Potentially titled VIPP-TPL, this process for engaging with teachers through video and mentorship, was grounded in the original VIPP model and similarly characterised by being situated in the real context, iterative, underpinned by trusted and collaborative relationships, and seeking to address real world problems through a learning and mentorship intervention.

Videoing teachers in their teaching and learning environments and the subsequent VLCs that took place based on the VIPP model were powerful modes of PL. The optional VLCs enabled the intentional linking of the Self-Reg PL to personal practice through social engagement. Those who chose to engage reported profound learning experiences – referred to by some researchers as "boundary experiences" (Bühler, 1935; Geijsel & Meijers, 2005; Meijers & Lengelle, 2012), to grapple with

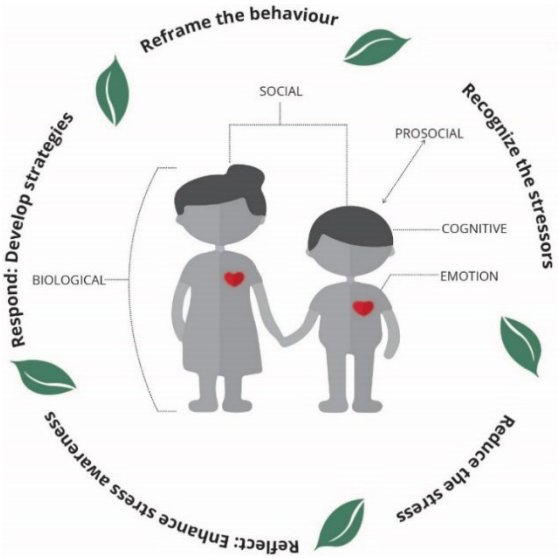
"mirrors" to their practice and "windows" (Berting, 2003) for me and others to "see" Self-Reg theory in action and deepen the learning for everyone. Highly involved participants gave evidence of transcending the mechanics of learning and applying self-regulation knowledge and skills as they began embodying self-regulation practices evolving their professional and personal identities (Dall'Alba, 2009).

Model 4: The 5 Steps and 5 Domains of Self-Reg

In the final iteration of this research, I applied the 5 steps and 5 domains process of Self-Reg (The MEHRIT Centre, 2021b) (depicted earlier in Figure 4 and again here) as a model to support a humanistic approach to PL in a highly challenging context. By seeking to recognise and reduce participants' stressors across the biological, emotion, cognitive, social, and prosocial domains, I worked to support them in balancing their energy and tension to enable engagement in self-regulation PL. VLCs added further opportunities to reflect to enhance stress awareness and develop growth-promoting strategies to respond through restoration.

Figure 4

The Shanker Method® Roundabout Graphic



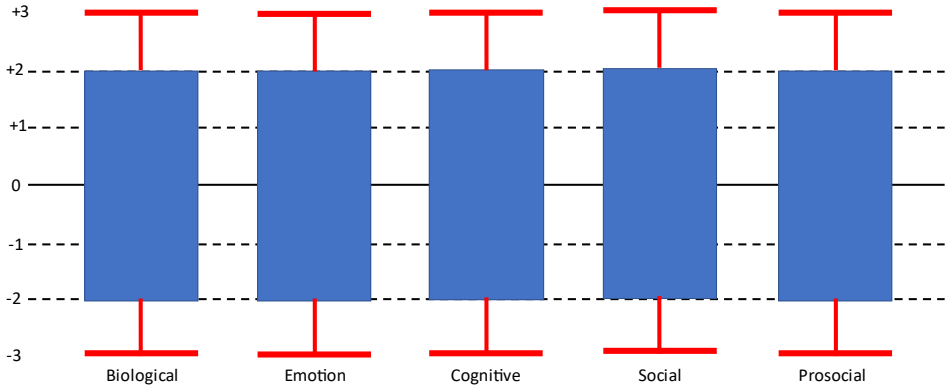
Tool 1: Energy and Tension Snapshot

I created the energy and tension snapshot as a practical way to support participants in applying their learning of Shanker's 5 domains of stress (Shanker, 2013) and Thayer's (1996; 2003) quadrants of energy and tension (see Figure 22). This

snapshot also considered invigorating or depleting stressors, similar to Selye's (1956) concepts of eustress and distress, and supported participants to develop their interoception (Porges, 2017) and to consider the neuroscientific learning relevant and accessible to educators through Maclean's (1977) model of the triune brain. Additionally, engaging with this snapshot enabled participants to recognise potential maladaptive strategies and consider growth-promoting replacements to support restoration. The energy and tension snapshot was endorsed by participants as an effective way to connect to the learning of the 5 domains of stress and a useful tool to consider where stressors lie and possible strategies to address imbalances of energy and tension.

Figure 22

Energy and Tension Snapshot



Tool 2: TORSH Talent

TORSH Talent provided 10 free licenses for this research, enabling video to be uploaded to their platform and easily accessed. This storage and access allowed for multiple viewings of practice both synchronously and asynchronously and enabled participant and mentor annotations to connect theory to practice, enriching the PL experience. In the final iteration, non-video participants also had the opportunity to engage in the annotation process. TORSH Talent was an effective and reliable platform conducive and effective within the context of this research. It was noted by

participants for its potential to support further PL within the research context and by me as an effective tool for future educational research.

Societal Outputs

The wellbeing of our teachers is the fundamental foundation for student wellbeing and academic success, and this in turn potentiates societal wellbeing (Shanker, 2020). The societal outcomes of this research continue to support a more hopeful trajectory and are evidenced beyond the data collection period within this context. I was curious to understand the impact of the self-regulation PL two years after I finished at the school so I contacted the former principal. He followed up with the current principal who wrote:

> *The Self-Regulation PL staff were involved with through the partnership with The University of Tasmania, led by Marie Edwards, was outstanding in developing understanding and capacity of the whole staff to help support the wellbeing and regulation of our students. It provided staff with contemporary evidence-based research and a practical lens to engage across the school day, classroom, and playground settings. Marie was able to instil a level of confidence in the teaching team that allowed her to video a few teachers in action, this provided real time evidence and reflection of practice as teachers worked on their own regelation tool kit to co-regulate students. So successful was this, that Marie had teachers approach her and invite her into their rooms to video their practice. The PL value-added to the existing framework the school had been working within. There was direct evidence of students being supported and engaged, with a reduction of students been relocated out of class, break time intervention, supervision, and a reduction of external school suspension.*
>
> *(School Principal, personal communication, October 26, 2021)*

It was heartening to learn that self-regulation PL from this research, underpinned by strong university partnerships (Swabey et al., 2021), continued to be part of more positive trajectories for teachers and students (Prain et al., 2019; Swabey et al., 2019). It was testimony to the ongoing legacy of the societal outputs stemming from this research.

At the same time as receiving this email, two years after my time at the school, I learned that three of the six highly involved participants were no longer at the school. Larissa and Christine had moved to other schools and Henry had left the teaching profession altogether. These participants had strong and growing relationships with others, the learning material, their own self-regulation practices, yet they left. Like Larissa, did Christine and Henry leave as a strategy to reduce the intense and ongoing stressors associated with working within this context? If so, what can be done differently to support educators in balancing their energy and tension so that they can thrive in these challenging environments and provide the support their students need without falling prey to toxic stress cycles? Although these teachers were no longer at this site, the understandings gained and applied from the self-regulation PL were transferable and beneficial in their personal and professional contexts beyond this school.

Further examples of societal outputs include contributions to the literature. Initial representation of this research within the literature explores university and school research partnerships in regional communities (Swabey et al., 2021); improving learning and wellbeing outcomes for students in low SES and regional contexts (Prain et al., 2019; Swabey et al., 2019); and, a self-authored paper (currently submitted for review), exploring teachers' willingness to be videoed as part of professional learning (Edwards, under review).

Implications

Many of the following implications seek to inspire important professional conversations. How can the needs of educators in highly challenging contexts be met? In what ways can theory, research methods, policy, and practice focus more on delivering improved outcomes for teachers in these contexts?

Implications for Theory

Various theories were considered in this research including constructivist, and social constructionism, situated learning theory, Self-Reg theory, polyvagal theory, learning theory, and relational theories. The following section shares implications from this research for these theories.

Constructivism and Social Constructionism

Theories of constructivism and social constructionism (Burr, 2015; Young & Collin, 2004) applied to this research. Participants used constructivist approaches as they engaged in their own "meaning making and the constructing of the social and psychological worlds through individual, cognitive processes" (Young & Collin, p. 375). There was also strong evidence of social constructionism, "emphasiz[ing] that the social and psychological worlds are real (constructed) through social process and interaction" (Young & Collin, p. 375) as participants engaged socially to construct their understanding of self-regulation (while sometimes deconstructing old paradigms of thinking) through action and reflection. Burr shared four assumptions accepted by social constructionists and each of these were evidenced in this research. The first assumption suggested "a critical stance toward taken-for granted knowledge" (p. 2). Participants needed to confront old paradigms of behaviour as they engaged with neuroscience. Assumption two, "historical and cultural specificity" (p. 3), situated the professional learning within the context and time. The third assumption suggested "knowledge is sustained by social processes" (p. 4). All elements of the research gave evidence to this as participants workshopped Self-Reg concepts in PL sessions, engaged in VLCs connecting Self-Reg theory to practice, and dialogued in group discussions to make sense of and give meaning to (Geijsel & Meijers, 2005) their learning. The final assumption Burr shared "knowledge and social action go together" (p. 5). Participants who engaged in VLCs in addition to the PL sessions credited the depth of their learning to this combination.

Situated Learning Theory

Lave and Wenger (1991) provided a theory on situated and peripheral learning that described various ways of learning that occurred in this research. The learning occurred within participants' teaching and learning context and once again video afforded the powerful opportunities for reflection and formal feedback. Working with video gave strong evidence of the power of situated learning as it personalised and contextualised the learning for VLC participants. Peripheral learning was evidenced as non-video participants collaboratively annotated their video counterparts' practice. New learning was noted by many as non-video participants engaged in peripheral

learning opportunities. The implications of this research on situated learning theory once again drew in stress theory. Were stressors mediating the choices participants made when engaging directly or peripherally in learning from their own (VLCs) or someone else's (annotating a colleague's video) practice? Further research might give further insight into the role stressors play in these situations.

Self-Reg Theory

Self-Reg theory (Shanker, 2013; 2020) had two roles within this research. It underpinned the PL intervention and was the theoretical lens for the humanistic approach applied to evolve the DPs in the final iteration. The implications can therefore be considered in two ways: Self-Reg as content for PL and Self-Reg as a PL approach.

Self-Reg theory as PL content provided a neuroscientific perspective on how the brain and body respond to stress, in addition to conceptualising stress, and offering various practices to support stress management. This PL prioritised teachers' development and application of self-regulation knowledge and skills as a pre-requisite for supporting their students' self-regulation. Self-Reg theory enabled me to respond to participant PL requests using Self-Reg as a theoretical lens. Highly involved participants integrated this learning into their professional practice (and beyond the workplace) as they worked towards "becoming" (Dall'Alba, 2009) better able to understand and manage (their own and others') stress. The neuroscientific understanding participants developed through learning Self-Reg theory, complemented by concurrent PL on the Neurosequential model (Perry, 2009), allowed participants to recognise dysregulation in themselves and in their students, and supported them in responding to restore calm and the subsequent capacity to teach and learn. The dual approach of Self-Reg PL workshops combined with opportunities to link Self-Reg theory to practice (through VLCs) was a powerful and transformative model of PL. It supported teachers in understanding and managing stress through growth and change in their awareness, mindset, and actions.

Self-Reg theory as a PL approach has significant implications, especially when providing PL to teachers in high stress contexts. This theory provided the understanding and scaffold to apply a humanistic approach to PL to individuals

navigating high stress loads. By using this approach, PL participants were supported to reframe their own stress-based behaviours, recognise stressors across the 5 domains and seek to reduce some of these. Reflection and restoration supported their capacity to restore energy and tension balance. Participants also learned which strategies resulted in positive outcomes and which lead to further dysregulation. Restoration was key for participants in high stress contexts who required high enough energy and low enough tension to be effective in their teaching and learning. The understanding and application of Self-Reg theory supported the reduction of stressors for those who needed it and a process for stress management.

Polyvagal Theory and Learning Theory

The intersectionality of polyvagal theory and learning theory was highlighted in this research underscoring the importance of recognising and restoring the ever-changing energy and tension state required for learning. In the literature review, I shared Merriam and Bierema's (2014) definition of a learning theory: a theory that "provides an explanation of how learning occurs as well as being suggestive as to how such an explanation translates into practice" (p. 25). Polyvagal theory explained *why* the capacity to learn is reduced when the brain perceives a lack of safety. Teachers in high stress contexts, experiencing enduring stress from personal factors, task factors, and work environment factors (Kwakman, 2003, p. 149), were compromised in their ability to fully engage in and grow from PL. Professional learning for highly stressed teachers, exhausted from their day, was often an additional stressor that further dampened their capacity to learn. By recognising and reducing stressors across the 5 domains through food, laughter, and conversation, tension was reduced for many participants enabling social engagement and learning. In this research, polyvagal theory informed learning theory suggesting significant implications for PL providers within high stress contexts to create optimal conditions for learning to take place.

Relational Theories

The power of relationships in learning are suggested in theories of relational agency (Burkitt, 2016; Edwards, 2007) and my research invited further thinking about the nature of relationships, including - and in addition to - the relationships we have with people. Edwards (2007) suggested that relational agency "allows us to work with

others in pursuit of ever expanding objects and to explore the possibilities these new objects reveal" (p. 6). Implications for relational theory stemming from this research suggested it's not just about personal relationships and prompted further consideration of what *other* relationships exist. How might the relationships we have with learning material and with professional practice bring similar affordances to growing our professional identities?

Implications for Research

This investigation also has implications for research. Design-based research, university partnerships in research, and the use of video technology in research are shared.

Design-based Research

Crippen and Brown (2018) promoted DBR as being "simultaneously committed to providing theoretical contributions and practical solutions to educational problems" (p. 490) suggesting the potential for positive outcomes for both informing the literature and addressing a need. Practical solutions to the problem of teacher stress management came in the form of the Self-Reg PL intervention, and for those who were highly involved, their learning and application were evident.

DBR methodology provided an effective frame and process for a longitudinal study in this highly complex context. The iterative nature of the research provided both rich data and supported ongoing PL with strong collaboration between research and participants. The cycles of the self-regulation PL intervention and subsequent VLC options and discussions enabled me to evolve DPs through regular and ongoing engagement with the literature. Data were collected through recorded and transcribed discussions and VLCs as well as questionnaires affording thematic analysis and triangulation.

In addition to evolved DPs, the iterative nature of DBR afforded a window into various aspects of PL trajectories. Although not linear, these aspects describe what transpired for participants who were learning about, applying, and embodying Self-Reg practices. Model 2, described earlier in the practical output section, gave details of this.

University Partnerships

Implications for collaborative investigations involving university researchers and school community members also came from this research. It exemplified qualities of a contemporary school-university partnership characterised by strong collaboration between researcher and participants, shared agendas, mutual benefit, and significant commitments of time, resources, and energy (Swabey et al., 2021). I was able to work full time on the project and consult continuously with participants, performing research *with* participants rather than *on* them. My familiarity with how schools function (from decades of teaching and leadership experience), commitment to my own Self-Reg PL and research, and my doctoral research through the University of Tasmania, established a strong foundation for mutual and positive outcomes for both the school and university communities.

Connection to the broader ARC research project provided additional access to financial resources, technical equipment, and an experienced team of researchers and the school was able to mobilise human resources to enable teacher release for VLCs. Using the four domain model of teacher PL provided by Clarke and Hollingsworth (2002), my expertise and these resources represented reciprocal relationships within the "external domain" affording growth in the "personal domain" (participants' knowledge, beliefs, and attitudes), the "domain of practice" (professional experimentation), and the "domain of consequence" (salient outcomes) (p. 951).

Ongoing PL can be an expensive enterprise for schools to fund (Muijs et al., 2014) and collaborative partnerships with universities and subsequent access to research grant funding can create affordances for all parties. Additionally, university partnerships provided access to the necessary technology (video cameras, storage cards, and microphones) for the video component in this research. In my role as researcher, I took on the pragmatics of organising and picking up the equipment, negotiating the video schedule, setting up and taking down equipment in classrooms, and uploading footage for viewing. These pragmatic activities were often noted as deterrents for teacher engagement in videoing their practice (Kleinknecht & Schneider, 2013). The university partnership preserved teachers' time, allowing them to focus on their teaching and learning priorities.

Video Technology in Research

Literature espouses video as an effective research tool (Hollingsworth, 2005; Major & Watson, 2018; Sherin & Han, 2004) and this was confirmed within my research. Participants who engaged in the VLCs consistently connected the deepening of their learning to this aspect. Video allowed them to "see" their practice, reflect on it, and dialogue about it, deepening their relationship with both the material (Self-Reg theory) and their own practice. It involved risk yet provided a window into their practice. Video enabled repeated viewing of practice, collaborative annotation and discussion, and resulted in the sharing of practice.

Implications for Policy

When something can be improved or something valued is threatened, policies "attempt to guide or manage change" (Welch, 2013, p. 188). This research exposed a "discrepancy between the intended and actualised state of an educational system" (Crippen & Brown, 2018, p. 2) in the way it meets the needs of teachers in extremely challenging contexts. It highlighted the need for improvement and gave examples of how the wellbeing of these teachers is threatened as they face the relentless challenges of their workplace. Therefore, this research has implications for policy makers for guiding and managing change. Suggested policies would address teacher wellbeing, teacher PL in challenging contexts, funding of necessary resources, teacher needs assessments and exit data, teacher placement and mentorship, and technology facilitated PL.

Policies for Teacher Wellbeing

While it is argued that all teachers might benefit from improving their emotional, cognitive, and behavioural competencies (Jennings & Greenberg, 2009; Jennings et al., 2021), it is particularly significant for those who work in intensely challenging contexts. The vicarious trauma reported by participants within this research and the ways this manifested both inside and outside of the workplace created the impetus for policy creation and enactment. Larissa, for whom leaving the school was the strategy to reduce debilitating stressors and continue in the teaching profession, advocated strongly for the inclusion of regular counselling support within this and similar contexts. She suggested that the government had no understanding of

the stressful nature of working within this context and suggested counselling similar to what a social worker or emergency response worker receives was critical. Without this support participants were left to turn to colleagues or school leaders to debrief, which was problematic due to the depleted levels of energy and escalated tension experienced by these allies.

My own experience in schools over 30 years allows me to suggest that not all schools need policies for regular counselling for staff to support their wellbeing; however, this research infers that policy considerations supporting teacher wellbeing in our most challenging contexts is essential. These policies may concurrently address aspects of teacher burnout that lead to teachers moving schools or leaving the teaching profession altogether, as well as support teachers in being social emotional leaders within their teaching and learning contexts (Jennings et al., 2021), positioning them well to provide care for students and create learning environments that cue safety and invite growth-promoting engagement in learning.

Policies for Teacher PL

This research suggests PL for teachers in challenging contexts benefits from a humanistic approach; one that recognises and responds to the excessive stress load inherent to their work. The scope of this research can also extend to inform teacher PL within any context given the complex and stressful world we live in and the many and varied challenges faced by educators in their work, in turn leading to a potential reduction in the number of highly challenging school environments. This could be supported by "policymakers and administrators [who] could evaluate and redesign the use of time and school schedules" (Darling-Hammond et al., 2017, p. 23). The depletion experienced by many participants at the end of the school day when PL sessions were scheduled resulted in reduced capacity to engage in their own learning. Those who were released from class to participate in one-to-one VLCs reported higher engagement and benefit. Policies implying release time or PL within the school day would need to be supported by funding.

Policies for Resource Funding

Policies could support resourcing of teacher PL in high stress contexts. Human resources (such as counselling, in class release time for PL, mentorship, or technology

support), learning resources (such as access to learning content through books, online courses, workshops), and technology resources (such as video equipment, or digital repository platforms like TORSH Talent) all require funding and policies could support teachers in highly challenging contexts to have easier access to these. Policymakers could make equitable funding allocations to address the contextual discrepancies.

Policies for Needs Assessment and Exit Data

Policies could support the regular and ongoing assessment of teachers' needs and collect data to understand teachers' experiences in schools and justifications for moving schools or leaving the profession. Policies supporting the collection of this data could create a more detailed account of PL and wellbeing needs of teachers and guide future directions in preservice teacher education and in-service teacher PL, funding priorities, and develop successful systemic support.

Policies for Teacher Placement, Mentorship, and Retention

How can our most challenging schools be staffed by our most qualified and experienced teachers? What kind of mentorship might be available to early career teachers who find themselves in these contexts? How can highly challenging schools retain excellent teachers? Policymakers need to consider these challenges to better support teachers providing continuity and consistency for students experiencing ongoing educational disadvantage. This may include resource allocation to increase staffing and reduce student to teacher ratios, or provide more team teaching opportunities.

Policies for Technology Facilitated PL

Darling-Hammond et al. (2017) advocated for the provision of "technology-facilitated opportunities for PL and coaching" (p. 24). My research also demonstrated the affordances of this being organised *for* teachers, not *by* them. Teachers were able to focus on teaching while someone else collected video equipment, took the video, uploaded it to the TORSH platform, and began the annotation. Policies are needed to minimise the additional stressors involved in PL technology. These policies could: support access to various technologies, platforms, mentors, and coaches; enable quick and effective modes to capture practice; prioritise personalised learning opportunities; enable individual and/or collaborative reflection; and support teacher

PL resulting in changes in action, awareness, and thinking. Policies could support technology-facilitated opportunities promoting teacher PL.

Implications for Practice

This research has strong implications for initial teacher education programs and in-service PL. Advances in neuroscience have gifted educators further understanding of how the brain works; affording both deeper self-awareness and more compassionate relationships. Traditionally, these neuroscientific insights (like teacher PL opportunities), centred on improving outcomes for students not teachers. This focus on improving the learning and wellbeing of students was evident in the eight schools involved in the wider ARC project, yet my research made teachers the focus of the learning. It prioritised *their* self-regulation learning and *their* stress management. Participants in my study learned to reframe their own behaviours (stemming from both positive and negative stressors), notice when they were dysregulated, and scan the 5 domains to recognise where stressors lay. They explored the maladaptive and growth-promoting strategies they used to reduce stress, affording more thoughtful choices. This research also suggests that teachers need to reflect on their energy and tension and learn ways to restore this balance.

As noted across the research, participants were unaccustomed to centring themselves in PL promoting their own wellbeing. They often noticed how they reverted to focusing this learning on students. As the research progressed, highly involved participants became more intentional about prioritising their own self-regulation and recognised this as the pre-requisite for successfully coregulating others.

Initial Teacher Education

It is difficult to imagine the experience of a new teacher whose first appointment was in a context such as this one. This research provided a critical lens to examine how we prepare teachers to not just survive but thrive in challenging contexts. This education needs to support aspiring teachers to understand the importance of intentional self-care including: self-awareness of energy and tension, self-regulated, and dysregulated states; an understanding of their own unique stressors and stress responses; and, personalised growth-promoting responses to

restore. Pre-service teachers also need to develop their capacity to detect these signs in others (students, colleagues, parents) and respond in coregulatory ways to meet the diverse needs of these individuals.

The neuroscience and processes offered by Self-Reg theory would be one way to engage pre-service teachers in this learning. Self-Reg challenges old paradigms within education systems and offers a current and science-informed approach to understand and successfully navigate personal and professional stressors inherent within the social settings of schools. Applying Self-Reg theory supports stress management as it inherently works to address energy and tension needs for teaching and learning by applying knowledge of the brain/body response to stress.

Teacher PL

This research validated and built upon the rich literature base on teacher PL. Themes of what makes PL effective from this research concurred with characteristics prominent in the literature such as:

- trusting, collaborative, professional relationships (Darling-Hammond et al., 2017; Davey & Ham, 2010; Thompson et al., 2020);
- worthy, relevant, and accessible content (Thompson et al., 2020; Timperley, 2008);
- iterative learning over a sustained duration (Clarke & Hollingsworth, 2002; Cooper et al., 2020; Darling-Hammond et al., 2017; Thompson et al., 2020; Timperley, 2008);
- opportunities for feedback and reflection (Clarke & Hollingsworth, 2002; Cooper et al., 2020; Darling-Hammond et al., 2017; Thompson et al., 2020);
- personalised (Cooper et al., 2020; Thompson et al., 2020); and,
- situated within context (Avalos, 2011; Borko, 2004).

Other themes connected to more specific components of my research suggesting further implications for effective teacher PL. These included mentorship (Davey & Ham, 2010), PL conversations (Earl & Timperley, 2009; Schuck et al., 2008), and the use of video in teacher PL (Kleinknecht & Schneider, 2013; Major & Watson, 2018; Sherin & Han, 2004).

This research also suggested characteristics of effective PL that are less prominent within the literature. These included teachers' energy and tension states and their experiences of excessive stress and ways this changes their capacity to engage in PL. Implications from this research suggest that in addition to a pragmatic and constructivist approach, PL providers might adopt a humanistic approach to further support highly stressed teachers. These providers can help teachers recognise and respond to their energy and tension states by considering the biological, emotion, cognitive, social, and prosocial domains. A personalised approach is recommended to acknowledge the unique needs of individuals and might occur through food, opportunities to socially engage, choice in PL opportunities, laughter, and shared practice.

A problematic factor of effective PL noted within this research was the timing of PL sessions. Consistent feedback from participants suggested that all PL should occur within the school timetable, with during-class time PL preferred to after-school learning. Participants reported depleted energy and high tension at the end of their workday suggesting this timing was not conducive to successful engagement in PL. This was noted by other researchers who suggested that "policy makers and administrators could evaluate and redesign the use of time and school schedules to increase opportunities for PL and collaboration" (Darling-Hammond et al., 2017, p. 23).

Limitations

Although this research was a longitudinal study of educators in a regional, low socioeconomic primary school in Tasmania, Australia, this singular context with its (approximately) 30 members is noted as one of the limitations of this study. Over the course of the research, there were absences and changes in staff and leadership resulting in inconsistent participation in PL and questionnaires. Consistency in data collection was mostly through the six highly involved participants. Although there is little generalisability due to this small number of highly involved participants, the detailed and unique perspectives their stories provide hold important insights for research.

Another limitation of this research stems from the "contextually rich nature of DBR projects and the embedded role of design researchers" (Crippen & Brown, 2018, p. 6). The challenging context was a mediating factor in this research and the Self-Reg intervention relied heavily on the multifaceted nature of the researcher role. Reproducing similar research would require researchers with: the appropriate Self-Reg education to provide PL and mentorship to participants; comfort and qualifications to work with students, teachers, and administrators; and, the ability to access and use video technology and online repository platforms. Due to the collaborative nature of this research, a different group of participants may also choose different self-regulation topics for their PL. These personalised topics could still be presented through a Self-Reg theory lens to meet the unique needs of the participants.

Time is another limitation of this research. Three iterations of research occurred over a year inviting further consideration of what might have transpired beyond this point. As with most DBR projects, the final iteration suggests a semicolon, rather than a full stop. The research offers the discussion of findings from a unique snapshot of time, in a specific context, with a unique and changing group of people.

Future Research

Research on Self-Reg theory PL is in its infancy. Rosati's (2020) research investigated effects a Self-Reg theory PL intervention on early childhood educator beliefs and practices regarding child behaviour, relationships with children, and professional stress. My research adds to the literature in this area with its focus on Self-Reg PL to support primary school teachers in a challenging low SES context with stress management. An extension of this research could further investigate the implications Self-Reg PL had on student wellbeing and academic outcomes. Further research featuring Self-Reg learning for a whole school community (including students, teachers, non-teaching staff, administrators, and parents) would further inform the literature.

Other possibilities for future research can be categorised similarly to the implications section of this chapter. Research could probe theory, research methods, policy, and practice. The perspective of stress theories combined with learning theories invites further exploration, so too does further investigation on the personal

and professional outcomes for individuals who engage in and apply Self-Reg theory. Further research on DBR methodology, engaging teachers in VLCs, and how university partnerships connect research and practice in educational settings could also be explored. Research on policy implementation seeking to reduce allostatic load of teachers in high stress contexts bids further investigation.

My research contributes to a growing literature base on the inclusion of neuroscience as part of in-service teacher PL and brings curiosity to research on how pre-service teachers may benefit from similar teaching and learning in their education. Further research on how to provide effective PL to ever-changing teaching teams is also suggested. It would be advantageous to better understand the role of stressors enabling or constraining teachers' choices to opt into or decline the PL opportunities available to them, and research on pivotal teacher boundary experiences in PL as catalysts for change and growth is recommended. Participants' application of Self-Reg and other PL offerings merged, changed, and grew over the course of this research without a clear fidelity to any singular approach. It would be interesting to further investigate the circumstances and reasons for this and might be a useful direction for future study. Finally, continued investigation into the relationships between maladaptive and growth-promoting self-regulation strategies and teacher burnout may further inform the literature. Supporting teachers in understanding the brain/body response to stress and managing stress through self-regulation will continue to provide significant and relevant avenues for research. Increasing teachers' capacity to do this is fundamental to their work with students, enabling positive trajectories for all to unfold (Jennings et al., 2021; Shanker & Hopkins, 2020).

Thesis Summary

This research recognised and described the highly complex nature of a low socioeconomic primary school teaching and learning community in regional Tasmania. It uncovered the rich diversity among the educators and their experiences. It captured the interplay between the stress of learning and the psychophysiological responses that determined when learning was and was not optimal or even possible. Most importantly, it gave a window into the courageous, and often exhausting, work of educators in highly challenging contexts. I now invite the important conversations

inspired by this research about how we can better meet teacher needs in highly challenging contexts through appropriate PL to support their self-regulation, so that these teachers, in turn, can enjoy improved wellbeing, thrive in their work, and be well-positioned to meet the needs of their students.

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Appendices

Appendix A: Ethical Approval Letter

-----Original Message-----
From: ss.ethics@utas.edu.au <ss.ethics@utas.edu.au>
Sent: Wednesday, 31 October 2018 2:48 PM
To: Karen Swabey <karen.swabey@utas.edu.au>
Cc: Tracey Muir <tracey.muir@utas.edu.au>; Damon Thomas
<Damon.P.Thomas@utas.edu.au>; Karen
Goodwin <kareng2@utas.edu.au>

Subject: Ethics Amendment Approved: H0015448 Improving Regional low SES Students' Learning and Well-Being

Dear Professor Swabey
Ethics Ref: H0015448
Title: Improving Regional low SES Students' Learning and Well-Being

This email is to confirm that the following amendment was approved by the Chair of the Tasmania Social Sciences Human Research Ethics Committee on 31/10/2018:
Addition of PhD student Marie-Christina Edwards to the research team, and the addition of a survey of the teaching staff.
All committees operating under the Human Research Ethics Committee (Tasmania) Network are registered and required to comply with the National Statement on Ethical Conduct in Human Research (NHMRC 2007, updated May 2015).

This email constitutes official approval. If your circumstances require a formal letter of amendment approval, please let us know.
Should you have any queries please do not hesitate to contact me.
Kind regards
Lisa Hall
--
Ethics Officer
University of Tasmania Electronic Communications Policy (December, 2014).
This email is confidential, and is for the intended recipient only. Access, disclosure, copying, distribution, or reliance on any of it by anyone outside the intended recipient organisation is prohibited and may be a criminal offence. Please delete if obtained in error and email confirmation to the sender. The views expressed in this
email are not necessarily the views of the University of Tasmania, unless clearly intended.

Appendix B: Teacher Project Information

LA TROBE UNIVERSITY School of Education | UNIVERSITY of TASMANIA | DEAKIN UNIVERSITY

TEACHER PROJECT INFORMATION SHEET

Improving Regional low SES Students' Learning and Well-Being

University of Tasmania Ethics Approval No: H0015448

Project Contacts:

Marie Edwards Faculty of Education University of Tasmania Room 521, Hytten Hall Sandy Bay, Hobart, TAS 7005 T: 04	Associate Professor Karen Swabey Interim Dean & Head of School Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3512	Dr Damon Thomas Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3588	Dr Tracey Muir Senior Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3261

Early in 2016, you received an information sheet and consent form about a joint university research study being conducted by La Trobe University, University of Tasmania and Deakin University. Your school has been involved in this study and will continue involvement throughout 2018 and 2019. As part of the study, we are interested in investigating how teachers learn about self-regulation and their perceptions on this learning on their management of stress.

In order to investigate this aspect we invite you to complete a pre, during and post-survey. The purpose of the surveys is to:

1. Record how teachers learn, understand and apply new knowledge on self-regulation gained through various professional development
2. Understand the effects of this knowledge on teacher and student wellbeing

As a participant educator, you will complete a pre, during and post-survey. All data from these surveys will be treated respectfully and confidentially. Neither your name nor any other identifying information will be used for reporting purposes or in any publication resulting from this study. We expect that most participants will be involved in completing 3 surveys prior to Dec 2019.

Your contribution is vital because it will add to our knowledge of effective strategies to address learning and well-being needs of teachers and students in regional areas. You will also benefit from the opportunity to reflect on and refine your teaching practice, and be part of a larger team of teachers and researchers. Participation is voluntary. You are free to refuse to participate, free to discontinue participation at any time, without prejudice.

If you have any questions regarding this project, please email Marie Edwards in the School of Education, University of Tasmania; mariechristina.edwards@utas.edu.au . If you have any queries that the investigator(s) have been unable to answer to your satisfaction, you may contact Katherine Shaw, Human Research Ethics Committee Tasmania Network, by phone on 03 62262763 or email katherine.shaw@utas.edu.au. Please cite Ethics Approval number HOO15448

Appendix C: Teacher Consent Form

LA TROBE UNIVERSITY School of Education | UNIVERSITY of TASMANIA | DEAKIN UNIVERSITY

TEACHER CONSENT FORM - SURVEY

Project Title: Improving Regional low SES Students' Learning and Well-Being

University of Tasmania Ethics Approval No: H0015448

Project Contacts:

Marie Edwards	Professor Karen Swabey	Dr Damon Thomas	Associate Professor Tracey Muir
PhD student Faculty of Education University of Tasmania Room 521, Hytten Hall Sandy Bay, Hobart, TAS 7005 T: 04!	Dean & Head of School Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3512	Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3588	Senior Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3261

I have read and understood the Teacher Information Sheet and Consent Form. Any questions I have asked about this research project have been answered to my satisfaction.
I understand that each survey will take approximately 20 minutes and will be held out of class time and that there will be 3 surveys conducted between 2018-2019.

I agree to participate in the survey, understanding that I may withdraw from the study at any time without prejudice to myself. I also understand that data I provide cannot be returned because of its anonymous or de-identified status.

I understand that data I provide will contribute to the findings of this study. I agree that the findings may be published in academic journals or presented at educational conferences on condition that neither my name nor any other identifying information is used.

Name of Participant .....

Signature .....

Name of Chief Investigator Associate Professor Karen Swabey

Signature

.....

Date .....

Appendix D: Teacher Video Information

LA TROBE UNIVERSITY School of Education | UNIVERSITY of TASMANIA | DEAKIN UNIVERSITY

TEACHER VIDEO INFORMATION SHEET

Improving Regional Low SES Students' Learning and Well-Being
University of Tasmania Ethics Approval No: H0015448

Project Contacts:

Marie Edwards	Associate Professor Karen Swabey	Dr Damon Thomas	Dr Tracey Muir
Faculty of Education University of Tasmania Room 521, Hytten Hall Sandy Bay, Hobart, TAS 7005 T: 04	Interim Dean & Head of School Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3512	Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3588	Senior Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3261

Early in 2016, you received an information sheet and consent form about a joint university research study being conducted by La Trobe University, University of Tasmania and Deakin University. Your school has been involved in this study and will continue involvement throughout 2018 and 2019. As part of the study, we are interested in investigating how students learn and how we can promote equal opportunity for our students. With this in mind, we would like to specifically investigate how teachers develop and apply self-regulation knowledge and skills to support their management of stress.

In order to investigate this aspect, we invited teachers to volunteer to be videoed in their teaching environment to capture where self-regulation knowledge and skills are being applied. You are a teacher who has volunteered to do this. This will involve:

1. 15-30 minutes of your teaching time being videoed once per term over three terms.
2. The researcher reviewing this footage to capture examples self-regulation with particular focus on the teacher professional learning themes for the term (In term 1 these include the effects of excessive stress on the brain, reframing behaviour, and stressors across the 5 domains.
3. You and the researcher reviewing this footage collaboratively to capture further (often unspoken) examples self-regulation with particular focus on the teacher professional learning themes for the term.

Appendix E: Teacher Video Consent Form

LA TROBE UNIVERSITY School of Education | UNIVERSITY of TASMANIA | DEAKIN UNIVERSITY

TEACHER CONSENT FORM - VIDEO

Project Title: Improving Regional Low SES Students' Learning and Well-Being

University of Tasmania Ethics Approval No: H0015448

Project Contacts:

Marie Edwards	Professor Karen Swabey	Dr Damon Thomas	Associate Professor Tracey Muir
PhD student Faculty of Education University of Tasmania Room 521, Hytten Hall Sandy Bay, Hobart, TAS 7005 T: 0456648682	Dean & Head of School Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3512	Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3588	Senior Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3261

I have read and understood the Teacher Information Sheet and Consent Form. Any questions I have asked about this research project have been answered to my satisfaction.
I understand that 15-30 minute video samples will be taken in my teaching space with the purpose of capturing examples of where I am applying self-regulation knowledge and skills. I understand that the researcher (Marie Edwards) and I will analyse and annotate this footage collaboratively, with the video footage being disposed of but the annotations saved as data.

I agree to participate in this video analysis process, understanding that I may withdraw from the study at any time without prejudice to myself.

I understand that data I provide will contribute to the findings of this study. I agree that the findings may be published in academic journals or presented at educational conferences on condition that neither my name nor any other identifying information is used.

Name of Participant .....

Signature .....

Name of Chief Investigator Associate Professor Karen Swabey

Signature
.....

Date .....

Appendix F: Parent and Student Project Information

LA TROBE UNIVERSITY School of Education | UNIVERSITY of TASMANIA | DEAKIN UNIVERSITY

PROJECT INFORMATION SHEET: Parents and students

Project Title: Improving Regional Low SES Students' Learning and Well-Being

University of Tasmania Ethics Approval No: H0015448

Project Contacts:

Marie Edwards Faculty of Education University of Tasmania Room 521, Hytten Hall Sandy Bay, Hobart, TAS 7005 T: 04!	Associate Professor Karen Swabey Interim Dean & Head of School Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3512	Dr Damon Thomas Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3588	Dr Tracey Muir Senior Lecturer Faculty of Education University of Tasmania Level 2, Building A Newnham, Launceston TAS 7248 T: +61 3 6324 3261

Your child's school is participating in research aimed at improving learning and wellbeing outcomes for students in regional low SES areas. Part of this research is investigating how teachers are developing knowledge and skills in self-regulation.

Your child's teacher has volunteered to be part of this research which involves a 15-30 minute video sample being taken while she is teaching. This will happen once per term over three terms. The video footage will be focusing on teacher practice and used for analysis, viewed, annotated, and analysed by the researchers and teaching staff at the school only, and then discarded.

This is an important study because it directly addresses regional disadvantage and aims to promote equality of opportunity for students in Australia. Therefore, the results of the research are likely to be applied in other schools throughout Australia.

This study has been reviewed and approved by the La Trobe University Human Ethics Committee (HREC Approval No. E15-133).

If you have any questions regarding this project, please contact Associate Professor Karen Swabey in the Faculty of Education, University of Tasmania, on (03) 6324 3512.

1

Appendix G: Withdrawal of Consent Form

LA TROBE UNIVERSITY
Faculty of Education

UNIVERSITY of TASMANIA

DEAKIN UNIVERSITY

WITHDRAWAL OF CONSENT FORM - Project

Project Title: Improving Regional low SES Students' Learning and Well-Being

La Trobe Human Ethics Approval No.: E15-133

Project contacts

Professor Vaughan Prain
Faculty of Education,
La Trobe University, Bendigo
P.O. Box 199, Bendigo VIC 3552
Ph: (03) 5444 7314

Professor Bruce Waldrip
Faculty of Education,
University of Tasmania
Locked Bag 1307
Launceston, Tasmania 7250
Ph: (03) 6324 3429

Professor Russell Tytler
Faculty of Education,
Deakin University
75 Pigdons Road,
Waurn Ponds Victoria 3216
Ph: (03) 5227 2376

I, ...(name) wish to WITHDRAW my consent to the use of data arising from my child(ren)'s or my participation. Data arising from my child(ren)'s participation must NOT be used in this research project as described in the Parent and Student Information Sheet. I understand that data arising from my participation will be destroyed provided this request is received within four weeks of the completion of my participation in this project. I understand that this notification will be retained as evidence of the withdrawal of my consent to use the data provided specifically for this research project.

Participant's name (printed): .....

Signature: .....

Date: .....

2

Appendix H: Pre-Iteration 1 Questionnaire

UNIVERSITY of TASMANIA

SELF-REGULATION SURVEY

Thank you for taking the time to complete this survey.

Please create a unique personal code (that you can repeat at a future date) using the following pattern:
Your birth date (day only); first 2 letters of your favourite colour; number of siblings

□□:□□:□

Please indicate the grade level(s) of the students you work with.

□K □1 □2 □3 □4 □5 □6

Additional information if needed:

Number of years teaching

□under 5 □5-9 □10-14 □15-24 □25-34 □35+

The aim of this survey is to collect information about how you learn, understand and apply new knowledge on self-regulation, and any impact this has on your own personal well-being and that of your students.

1. What does the term "self-regulation" mean to you? Provide a short definition

2. Indicate where you have gained your knowledge of self-regulation.
   Rate the effect this professional development has had on your teaching practice.

   Rating scale 1-4
   1: No effect 2: Small effect 3: Medium effect 4: Large effect

Type of professional learning	**Name of specific sources**	**Effect on practice rating**
□ Reading books/journals		
□ Workshop (1-2 hours)		
□ Conference (1-3 days)		
□ Course (1-6 weeks+)		
□ Printed program (Eg: Zones of Regulation, MindUp, Berry Street…)		
□ Visiting/guest teacher working with you in your learning space (Ravenswood colleague, Lisa Drinkwater, Marie Edwards…)		
□ Policies		
□ Processes		
□ Informal conversations with other staff		
□ Online media		
□ Other		

Additional comments or explanations:

3. In what ways are you applying your understanding of self-regulation and what improvements in well-being have you noticed as a result?
   Only tick those that apply to you, and/or add your own examples

   Rating scale 1-4
   1: No effect 2: Small effect 3: Medium effect 4: Large effect

Ways I'm deliberately applying what I have learnt	Examples	Rating of effect on well-being
□ whole class lessons	□ Zones of Regulation lessons □ Strategies for upregulating and down regulating □ Teaching how the brain works: Amygdala bottles models □ Co-regulating (students supporting peers to regulate) □ □	____ ____ ____ ____
□ individual students depending on their need	□ Personalised strategies for upregulating and down regulating □ One to one conversations about stressors and strategies □ Viewing a student with an understanding of the impact stressors are having and a child and responding to behaviour with this in mind □ □	____ ____ ____
□ with parents	□ Sharing self-regulation insights when discussing child □ Considering their stressors when communicating with them □ □	____
□ with colleagues	□ Sharing self-regulation insights □ Considering their stressors when communicating with them □	____ ____

□ with my own family	□ Sharing self-regulation insights □ Considering their stressors when communicating with them □	____ ____
□ with myself	□ Considering my own personal stressors and their sources □ A growing awareness of my body's physiological response to stressors □ Applying strategies that help in managing stressors and experiencing calm □ An awareness of being regulating, dysregulating or dysregulated □	____ ____ ____ ____

Additional comments:

4. Record any examples of improved well-being that you have observed?

	Well-being
Individual students	
Whole class	
Your own	
Whole school	

Would you be interested to learn more about self-regulation? □ Yes □ No

If yes, please check off any specific areas you would like to know more about?

□ The importance of relationships in self-regulation

□ The brain and self-regulation

□ The effect of excessive stress on the brain

□ Self-regulation as the management of energy and tension (up and down regulating)

□ Reframing behaviour (differentiating between misbehaviour and stress behaviour)

□ 5 domains of stress (hidden and overt)

□ Working from adult regulation to self-regulation

□

□

Preferred ways to learn
□ short videos that I can view in my own time

□ written text (books, blogs…)

□ in person workshops (staff meeting PD)

□

□

Additional comments:

Thank you for completing this survey

Appendix I: End of Iteration 1 Questionnaire

UNIVERSITY of TASMANIA

SELF-REGULATION SURVEY 2
Iteration 1, 2019

Thank you for taking the time to complete this survey.

The aim of this survey is to collect information about how you are developing and applying self-regulation knowledge and skills, and what the perceived influence of this learning is on your management of stress.

Please use your personal code using the following pattern:
Your birth date (day only); first 2 letters of your favourite colour; number of siblings

□□:□□:□

Please indicate the grade level(s) of the students you work with.

□K □P □1 □2 □3 □4 □5 □6

Additional information if needed:

Number of years teaching

□under 5 □5-9 □10-14 □15-24 □25-34 □35+

Gender

□ male □ female □

Please record some personal reflections on your own experiences (positive and/or challenging) of self-regulation this term.

Whole staff professional learning was delivered at the beginning of this term covering:

□ The effect of excessive stress on the brain

□ Reframing behaviour (differentiating between misbehaviour and stress behaviour)

□ 5 domains of stress (hidden and overt)

Support materials including further readings and vignettes were provided.
You may have also learnt about self-regulation from other sources.

Please provide feedback on your professional learning detailing what worked well, suggested changes, future considerations…

This can include things like the content, mode of delivery, timing, collaboration, frequency…

Explain whether or not your learning about self-regulation is influencing your own management of stress and give examples to illustrate. (Before I….. Now I…..)

In which contexts/locations, with whom, and how often do your find yourself deliberately applying self-regulation knowledge and skills for your own management of stress?

Planning for future professional learning.

At the beginning of term 2, I will be returning to provide continued professional learning in self-regulation from the perspective of teachers managing stress.

Please indicate what you would like to have included in this session

- ☐
- ☐
- ☐
- ☐
- ☐

Consider how the learning has been presented so far (workshop, readings, supplementary videos, video sampling and conversations).
Please indicate if there are further suggestions you have regarding how you would like to learn and apply self-regulation.

Additional comments:

Thank you for completing this survey

Appendix J: End of Iteration 2 Questionnaire

UNIVERSITY of TASMANIA

SELF-REGULATION SURVEY 3
End of iteration 2, 2019

Thank you for taking the time to complete this survey.

The aim of this survey is to collect information about how you are developing and applying self-regulation knowledge and skills, and what the perceived influence of this learning is on your management of stress.

Please use your personal code using the following pattern:
Your birth date (day only); first 2 letters of your favourite colour; number of siblings

□□:□□:□

Please indicate the grade level(s) of the students you work with.
□K □P □1 □2 □3 □4 □5 □6
Additional information if needed:

Number of years teaching

□under 5 □5-9 □10-14 □15-24 □25-34 □35+

Gender

□ male □ female □

1. Describe how you are *developing* self-regulation knowledge and skills?

2. What has helped you the most to apply what you are learning?

3. What makes it difficult for you to apply what you are learning?

4. Explain whether or not your learning about self-regulation is influencing your own management of stress and give some examples to illustrate. (Before I….. Now I…..)

5. In which contexts/locations, with whom, and how often do your find yourself deliberately applying self-regulation knowledge and skills for your own management of stress?

6. Share what you understand about the 5 step Shanker Method

Include any personal examples of how you have applied the steps to yourself or others

Reframe:

Recognise:

(5 Domains)

Reduce:

Reflect:

Respond:

In term 1, whole staff professional learning was delivered focusing on the science of how the body and brain respond to stress, stress behaviour vs misbehaviour, and the 5 domains of stress.

In term 2, whole staff professional learning was delivered focusing on strategies used by emergency service providers and the 5 step Shanker method for self-regulation and coregulation.

7. Please explain if/how the learning so far has changed your thinking?

8. Please explain if/how the learning so far has changed your actions?

9. Please explain if/how the learning so far has had an impact on how you understand and/or manage your own stressors?

Planning for future professional learning.

At the beginning of term 3, I will be returning to provide continued professional learning in self-regulation from the perspective of teachers managing stress.

10. Please indicate what you would like to have included in this session

□

□

□

□

□

Consider how the learning has been presented so far (workshop, readings, supplementary videos, video sampling and conversations).
Please indicate if there are further suggestions you have regarding how you would like to learn and apply self-regulation.

Additional comments:

Thank you for completing this survey

Appendix K: End of Iteration 3 Questionnaire

UNIVERSITY of TASMANIA

SELF-REGULATION SURVEY 4
End of iteration 3, 2019

Thank you for taking the time to complete this survey.

The aim of this survey is to collect information about how you are developing and applying self-regulation knowledge and skills and what the perceived influence of this learning is on your management of stress.

Please use your personal code using the following pattern:
Your birth date (day only); first 2 letters of your favourite colour; number of siblings

□□:□□:□

Please indicate the grade level(s) of the students you work with. (Tick all that apply).

□ K □ P □ 1 □ 2 □ 3 □ 4 □ 5 □ 6

Additional information if needed:

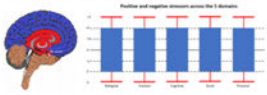
Number of years teaching:

□ under 5 □ 5-9 □ 10-14 □ 15-24 □ 25-34 □ 35+

Gender:

□ male □ female □ prefer to describe _____

1. Please **tick** the elements of this research that you have been present for/involved in.

	Professional learning	Video feedback	End of term survey
2018	□ Self-regulation sessions for students and teachers where the following topics were covered: * how the brain responds to stress * 5 domains of stress * up-regulating and down-regulating * understanding stress-based behaviour	N/A	□ Survey This survey captured your understanding of self-regulation, where your knowledge has come from, how you are applying it, improved well-being as a result of this learning, what you would like to learn more about and how you would like to do this learning.
Term 1, 2019	□ PL session covered: * The effect of excessive stress on the brain * Reframing behaviour * 5 domains of stress	□ No video taken OR □ Video taken □ Feedback session with Marie	□ Survey This survey asked you share personal reflections on your experiences (both +ve and -ve) of self-regulation. You also had the opportunity to reflect on the content and mode of professional learning. Finally, you were invited to share whether the learning was influencing your management of stress and the contexts you were applying it in.
Term 2, 2019	□ PL session covered: * Emergency services stress management processes  	□ No video taken OR □ Video taken □ Feedback session with Marie using TORSH	□ Survey This survey asked you to describe how you are developing self-regulation and what has helped or hindered this learning. It captured how the learning is influencing your management of stress and the contexts in which you are applying it. There was an opportunity for you to share your understanding of the 5 Step Shanker Method and explain changes in your thinking, actions.
Term 3, 2019	□ PL session covered: * Review of learning. Teams sorted key terms and shared understanding.  * Application of the 5 steps of self-reg to teacher videos in small groups.	□ No video taken OR □ Video taken □ Feedback session with Marie using TORSH	□YES (This is it😊)

2. What does the term "self-regulation" mean to you?

_____

_____

_____

_____

3. There are many ways to learn about self-regulation. The following list suggests some.

Please begin by rating the effectiveness of all the ways you have learnt about self-regulation over the last 12 months.

Rating scale 1-4
N/A: Not applicable 1: No effect 2: Small effect 3: Medium effect 4: Large effect

Type of professional learning	**Name of specific sources**	**Effect on practice rating**				
□ Reading books/journals		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Trauma Informed Practice workshops with Lisa D		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Self-Reg workshops with Marie		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Other workshop (1-2 hours) Please specify		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Conference (1-3 days) Please specify		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Course (1-6 weeks+) Please specify		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Printed program (Eg: Zones of Regulation, MindUp, Berry Street…)		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Guest teacher working with you in your learning space (RHPS colleague, Lisa D, Marie E…)		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Video of own practice and collaborative feedback session		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Policies		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Processes (Eg: 5 Step Shanker Method)		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Informal conversations with other staff		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Online media		□ N/A	□ 1	□ 2	□ 3	□ 4
□ Other		□ N/A	□ 1	□ 2	□ 3	□ 4

Continuation of question 3.

Based on your ratings, reflect upon your **3 most powerful sources** of self-regulation learning.
Describe the reasons behind this.

Powerful source of professional learning #1: Reasons this was powerful for you:
Powerful source of professional learning #2: Reasons this was powerful for you:
Powerful source of professional learning #3: Reasons this was powerful for you:

4. Over the last 12 months, rate your perceived **growth in understanding and knowledge** (not application) of self-regulation.

☐	☐	☐	☐
Extreme	Moderate	Slight	No perceived growth

5. If you perceived growth in understanding and knowledge, please describe aspects of your growth that surprised you?

_____
_____
_____
_____
_____
_____
_____

6. How challenging was it to learn self-regulation knowledge and skills?

☐	☐	☐	☐
Extremely challenging	Moderately challenging	Slightly challenging	Not challenging

7. Describe any challenges you experienced learning about self-regulation.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

8. Over the last 12 months, rate your perceived **growth in application** of your knowledge and skills of self-regulation.

☐	☐	☐	☐
Extreme	Moderate	Slight	No perceived growth

9. If you perceived growth in your application of self-regulation knowledge and skills, please describe aspects of your growth in application that surprised you?

_____
_____
_____
_____
_____
_____
_____

10. In what ways have you applied your knowledge and skills of self-regulation?

_____
_____
_____
_____
_____

11. How challenging was it to **apply** self-regulation knowledge and skills?

☐	☐	☐	☐
Extremely challenging	Moderately challenging	Slightly challenging	Not challenging

12. Describe any challenges you experienced applying what you are learning about self-regulation?

_____
_____
_____
_____
_____

13. Have you been videoed in your practice by Marie this year?
    YES (go to question 14)
    NO (Please explain why you chose not to be videoed then go to question 17)

_____
_____
_____
_____
_____
_____

14. Describe the experience of being videoed and/or having the opportunity to discuss the video with Marie.

_____
_____
_____
_____
_____
_____
_____

15. Was your video shared with other staff members to collaboratively reflect upon where self-regulation was occurring for you and/or your students?
    YES (go to question 16) NO (go to question 17)

16. Describe the experience of collaboratively sharing your video with other staff members.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

17. Did you have the opportunity to watch someone else's video and practise recognising where self-regulation was being applied?
    YES (go to question 18) NO (go to question 19)

18. Describe the experience of viewing someone else's practice to recognise where self-regulation was being applied.

_____
_____
_____
_____
_____
_____
_____

19. If there was a similar opportunity to be videoed again next term, is this something you would be interested in? Please explain your response.

_____
_____
_____
_____
_____
_____

20. Explain how your learning about self-regulation is influencing your own management of stress and give some examples (classroom and non-classroom) to illustrate.

Examples:

_____
_____
_____
_____
_____
_____
_____
_____

21. In which contexts/locations do your find yourself deliberately applying self-regulation knowledge and skills for your own management of stress? (Tick all that apply).

□ Classroom □ Staffroom □ Staff meetings □ Driving

□ At home □ Whole school events _____ □ Other _____

Examples:

_____

_____

_____

_____

_____

22. With whom do you find yourself deliberately applying self-regulation knowledge and skills? (Tick all that apply).

□ Students □ Colleagues □ School parents □ Family

□ Friends □ Other _____ □ Other _____

Examples:

_____

_____

_____

_____

_____

23. How often do you deliberately apply the learning you have done about self-regulation when managing stressors?

□ Always □ Often □ Sometimes □ Rarely □ Never

Explain your response:

_____

_____

_____

_____

_____

_____

24. How often do you deliberately apply one or more of the steps in the 5 step Shanker method when managing **your** stressors?

Reframe behaviour from misbehaviour to stress behaviour	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Recognise stressors	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Reduce stress load	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Reflect to enhance stress awareness	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Respond with strategies to restore energy	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never

Comments

_____

_____

_____

25. How often do you deliberately apply one or more of the steps in the 5 step Shanker method when managing **others'** stressors?

Reframe behaviour from misbehaviour to stress behaviour	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Recognise stressors	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Reduce stress load	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Reflect to enhance stress awareness	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Respond with strategies to restore energy	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never

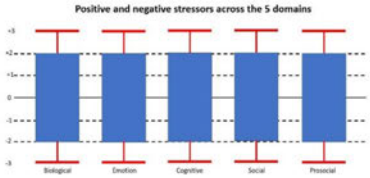
Comments

_____

_____

_____

26. How often do you deliberately consider the five domains of stress when managing **your** stressors?



Biological	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Emotion	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Cognitive	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Social	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Prosocial	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never

Comments

_____

_____

_____

27. How often do you deliberately consider the five domains of stress when managing **others'** stressors?

Biological	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Emotion	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Cognitive	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Social	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never
Prosocial	□ Always	□ Often	□ Sometimes	□ Rarely	□ Never

Comments

_____

_____

_____

28. When participating in professional learning about self-regulation, please indicate (in the left-hand column) the **importance** you place on the factors listed. In the right-hand column, please reflect on your **experience** of these factors in relationship to the professional learning you have been involved in for this research project. Please give additional comments in the spaces below to provide more detail.

What **importance** do you place on the following factors when participating in learning about self-regulation (the management of stress)?	What was your **experience** of these factors, throughout the research?
a. Establishing and maintaining effective relationships with colleagues ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	a. I established and maintained effective relationships with colleagues ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
b. Establishing and maintaining effective relationship with the presenter(s) ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	b. I established and maintained an effective relationship with the presenter ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
c. Ensuring relevant and effective dissemination of knowledge and skills ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	c. Dissemination of knowledge and skills was relevant and effective ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never

d. Having an opportunity to suggest content for learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	d (i). There were opportunities to suggest content ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never d (ii). I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
e. Having an opportunity to suggest modes of learning (reading, video, face-to-face) ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	e (i). There were opportunities to suggest modes of learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never e (ii). I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
f. Opportunities to apply the learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	f (i). There were opportunities to apply the learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never f (ii). I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never

g. Opportunities for receiving feedback on the application of the learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	g (i). There were opportunities for receiving feedback on the application of the learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never g (ii) I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
h. Opportunities for personal reflection on the learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	h (i). There were opportunities for personal reflection on the learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never h (ii). I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
i. Opportunities for whole staff discussions about the learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	i (i). There were opportunities for whole staff discussion about the learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never i (ii). I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never

j. Sharing of practice (examples) highlighting the application of the learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	j (i). Examples of practice were shared highlighting the application of the learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never j (ii). I took the opportunity to share my practice ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
k. Food included ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	k. Food was included ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
l. The temperature, lighting, acoustics of the professional learning environment ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	l. The learning environment was comfortable ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never

m. The timing (time of the day or week) of the learning ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	m. The timing of the learning suited my needs ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
n. The pacing and frequency of the professional learning / application cycles ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	n. The pacing and frequency of the professional learning and application cycles met my needs ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
o. The opportunity to revisit previous content ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	o. There were opportunities to revisit previous content ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never

p. The opportunity to reflect on your own energy levels across the domains prior to professional learning and apply strategies that could create a calm, alert state for learning. ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	p (i). There were opportunities for whole staff discussion about the learning ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never p (ii) I took these opportunities up ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
q. Having a mentor/peer to support the connection between knowledge and application ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	q. I had a mentor and/or peer supporting me to connect self-regulation knowledge with application ☐ Always ☐ Mostly ☐ Sometimes ☐ Rarely ☐ Never
r. Other _____ ☐ Extremely important ☐ Very important ☐ Somewhat important ☐ Not very important ☐ Unimportant	Additional comments:

29. Is it important to you that professional learning on self-regulation continues beyond this project?
    Yes (explain your answer and go to question 30)
    No (explain your answer)

_____
_____
_____
_____
_____
_____

30. Beyond this project, how do **you** intend to continue learning and applying self-regulation knowledge and skills to manage stress?

_____
_____
_____
_____
_____
_____

Any other comments

_____
_____
_____
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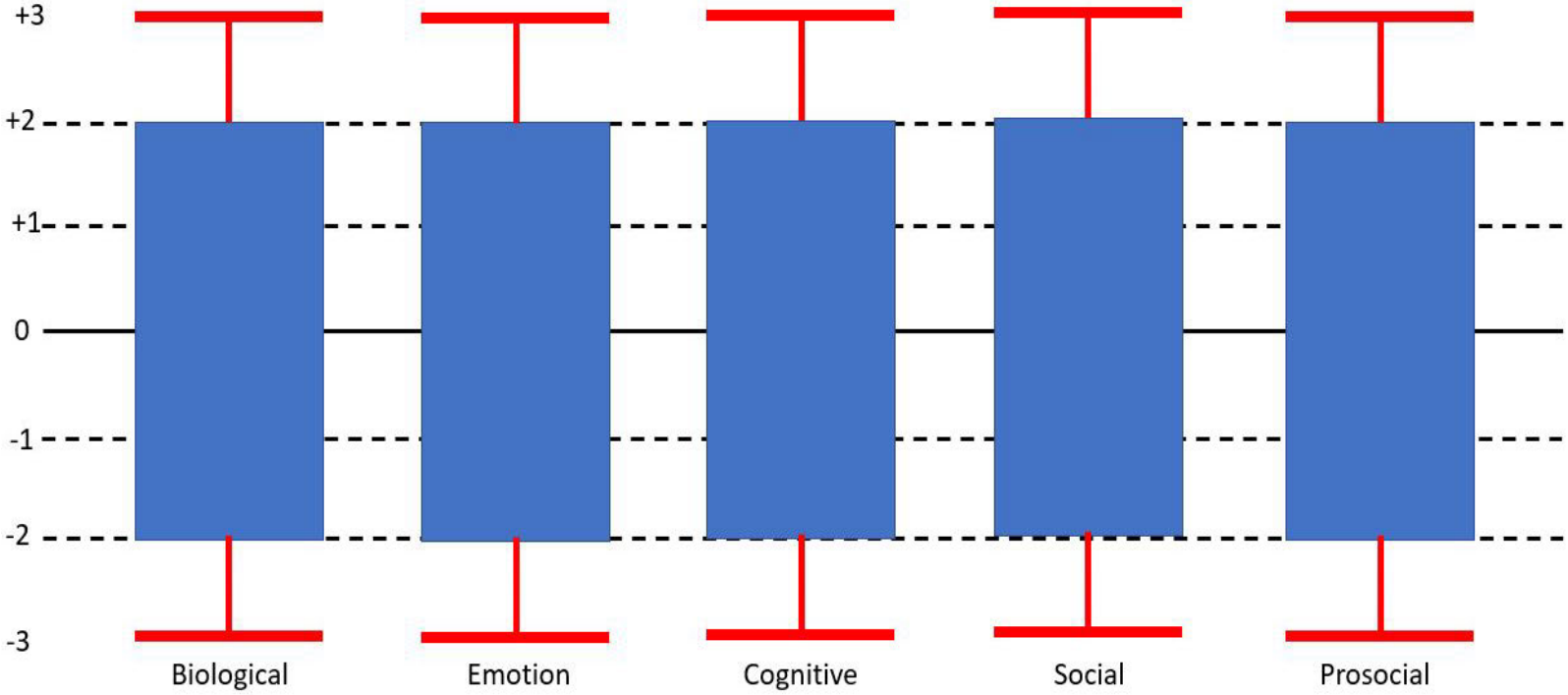
_____

Thank you for completing this survey and for your participation in this research project.

Appendix L: Energy and Tension Snapshot



Appendix M: Example Analysis Q1 Pre-Iteration 1 Questionnaire

IT0 – S - QUESTION 1

The first question of Iteration 0 -survey asked staff to define self-regulation. Their responses covered both qualities of self-regulation as well as elements (who, what, when, where, how, and why).

Qualities included: dynamic (2/22); continuous (1/22); independent (1/22); social (1/22).

Who: self, others, students.

What is being regulated?

DR-IT0 Key themes: Emotions (9/22); behaviour (4/22); various kinds of stress (5/22)

Emotions, mood, and feelings (9/22) – Emotions

Behaviour and responses (4/22) – Behaviour

Stress (2/22)

Social (1/22)

Cognitive (1/22)

Physical (1/22)

When:

Continuously (1/22)

Where:

Work and play (1/22)

Healthy place (1/22)

How:

DR-IT0 Key themes: Strategies (13/22); control (4/22); awareness (6/22); regulate (3/22)

Strategies, tools, and approaches (9+3+1/22) Strategies

Control (4/22)

Ability to identify state(2), awareness(1), recognise behaviour(1), monitor(1), feel safe(1) (6/22) Awareness

Regulate (3/22)

Why:

DR-IT0 Key themes: Optimal place for learning (7/22); Control (4/22); Calm and safe (2/22); Self-awareness

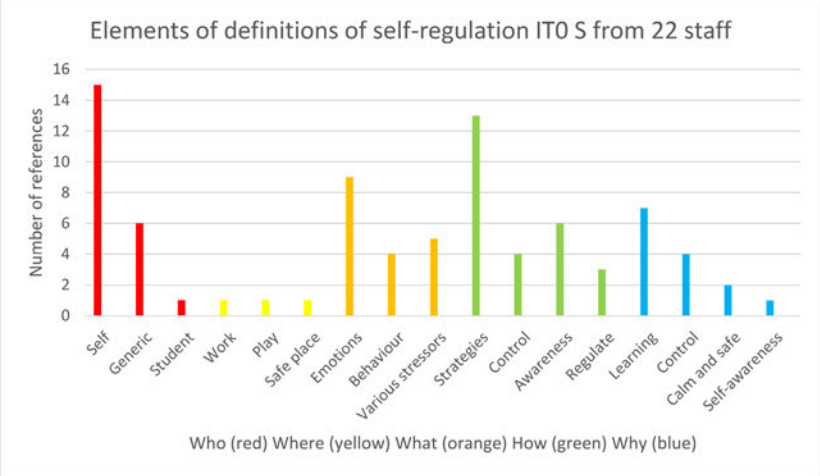
Optimal place for learning, healthy place(1) (7/22) Optimal place for learning

Control emotion, readjust moods, feelings, choose/change response (4/22) Control

Bring back to calm feel safe (2/22) Calm and safe

Know reasons for feelings (1/22) Self-awareness

Data display for Q1



Drawing conclusions/verification

Staff have defined self-regulation predominantly through their own lens when providing this definition. Locations of where self-regulation occurs/is relevant were mentioned by 2 participants. Emphasis was placed on the definition of self-regulation being on regulating emotions and behaviour. One staff member referred to other possible stressors. The idea that self-regulation required strategies was well supported with 13 counts. Control was an element that was mentioned four times. The connection between self-regulation and self-awareness arose. Reasons for self-regulation were predominantly around learning and maintaining control.

Interesting notes on these conclusions include:

Staff have been working with the Zones of Regulation program that focuses on emotions, this could explain the high number of responses for this element.

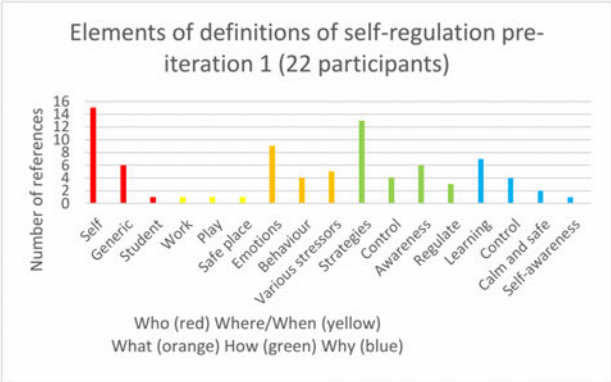
Appendix N: Example Analysis Q2 End of Iteration 3 Questionnaire

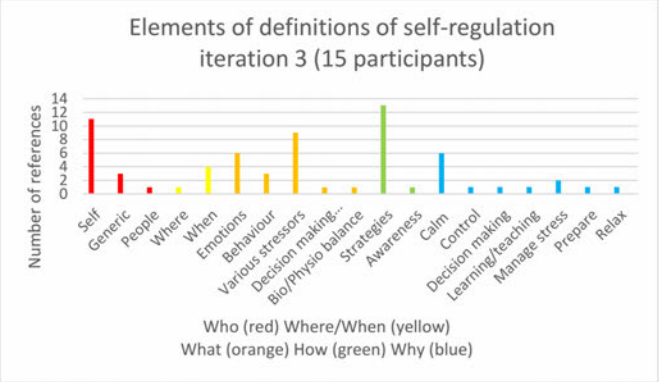
Question 2 What does the term self-regulation mean to you?

	Iteration 0	Iteration 3	WHO	WHERE/ WHEN	WHAT	HOW	WHY	AWARE
01BL0	Being about to get yourself into and optimal space for learning or functioning best for work or play.	The strategies the people knowingly use to feel/be calmer.	people		calm	strategies	calm	Knowingly
01BL1	Being able to self-regulate feelings and emotions to be able to learn effectively.	It is a way of returning levels of biological/physiological chemicals to normal levels.	generic		Returning bio and physio chemical to normal			
02PI5	Being able to readjust your mood of feeling using a strategy that is calming for you.	Being able to use learned strategies to control an emotion or reaction to an incident before during or after it occurs.	self	Before during after	Emotion and reaction	Learned strategies	To control emotion or reaction	
03BL3b	Being able to identify the state that your mind/self is in and bring yourself back to a calm state through known strategies.	It means being able to calm my emotions and be able to make sound decisions.	self		Ability to calm emotions and make sound decisions		Calm emotions Make sound decisions	
04PI2		Being able to use strategies to calm.	generic		calm	strategies	To calm	
06BL2		A holiday – or visualising a calm peaceful place relevant to me	self	Holiday or calm place	calm	Visualising (strategy)		
07BL2		Understanding the best way for me to reduce my stress in challenging situations and acknowledging things which cause me stress.	self	In challenging situations	Reduce stress	Understand and acknowledge		Acknowledge things that cause me stress

07OR3	To be able to control your emotions and use a tool that will help you to be a focussed learner.	Using strategies/tools to calm yourself down when stress levels are high/low. Looking after your wellbeing and be focussed on learning/teaching.	self	When stress levels are high/low	Looking after your wellbeing Stress	Using strategies/ tools	Be calm and a focussed learning/ teaching	
11RE3	The ability to use strategies to regulate/calm self down when feeling stressed, anxious/ dysregulated.	The ability to regulate your own emotions and behaviour.	self		Regulate emotions and behaviour			
14GR1	Being able to monitor, control and regulate your emotions by yourself. Being able to recognise your emotions.	Becoming aware of your emotional state, things that affect and knowing ways to adapt to ensure you are able to calm yourself – physically, emotionally	self		Emotional state	Knowing ways to adapt	Calm yourself physically and emotionally	Becoming aware of emotional state, things that affect
14YE2	Ability to regulate responses to stressors.	Being aware of and able to manage your emotions and responses.	self		Emotions and responses		Manage emotions and responses	Being aware
16BL0	Being able to apply known strategies to help myself to be and maintain being in a calm state. This will then allow me to be receptive to others and new ideas.	Having strategies to manage yourself when feeling overwhelmed and being able to bring yourself to a calm place.	self	When feeling overwhelm ed	Ability to bring self to a calm place	strategies	Bring to calm	
22OY2	Self-regulation – we all continually work on regulating ourselves. It's about working out strategies that work for ourselves to manage our	Taking time for self to relax	self		Taking time for self to relax		relax	

	feelings and get ourselves into a healthy place.							
28BL2	Being able to regulate your emotions without the help of others – eventually without physical tools.	Using tools – not always concrete to regulate your emotions to be ready to face the next challenge.	self		Using tools (not always concrete) to manage emotions		To be ready to face the next challenge	
30BL2	Being able to manage stress and behaviours so you can function and learn in any space through a variety of strategies	The ability to manage stress and stressors.	generic		The ability to manage stress and stressors		Manage stress	
			1 people 3 generic 11 self	4 When 1 Where	6 emotions 3 behaviour 9 stress/calm 1 bio physio homeostasis 1 sounds decisions	7 strategies 1 understanding	6 calm 1 control 1 decisions 1 learning/ teaching 2 manage (stress, emotions, responses) 1 prepared for next 1 relax	4 awareness





Analysis:

Who: Self continues to feature (no surprises there)

Where/When: definitions included more references to *when* SR is used and less to *where*

What: Various stressors were more frequently referred to with emotion and behaviour still being individually mentioned

How: Strategies featured strongly, control not mentioned within how.

Why: Calm became the feature in place of learning

After a year of learning participants showed a shift in thinking in *what* is being regulated, *how* to regulate and the *purpose* behind self-regulation.

Appendix O: Mike's Data Matrix

Mike

[redacted] (1) #2

5 Domains	Biological	Emotion	Cognitive	Social	Prosocial
	II (2)	I (1)			
5 Steps	**Reframe**	**Recognise**	**Reduce**	**Reflect**	**Respond**
		III (3)	~~IIII~~ I (6)	~~IIII~~ (5)	I (1)
Teaching SR	**Learning SR**	**Behaviour consequences**	**Science**	**Relationships**	**Co-regulation**
	II (2)	I (pg 3) "Next warning you're out" (1) ok.		I - TA I - on my own I laughter ~~IIII~~ Logan (8)	III (3) (yelling / not yelling) percent
Personal Strategies	**Strategies student**	**Strategies colleague**	**Strategies other**		
I II (8) · podcasts · whole class · stop everything · another adult · debrief	I (4) · whole class · knowing about changes · predictability · routine.				
Stressor examples	**Stressor examples**	**Stressor examples**	**Stressor examples**	**Stressor examples**	**Stressor examples**
I students requiring a lot of attention	· no matrix after work	II · TA timetable	kids yelling over a lunchtime incident.	calming students.	· dealing with issues (students) senior staff have already dealt with
Temporary stress	**Accumulated stress**	**Positive stress**	**Negative stress**		
~~IIII~~ II (7)	I - 5 kids cyclone I treading water (2)	IIII Laugh I (p 8 Logan) I (p 9 logan) (6)	~~IIII~~ II I laugh (8)	Change - different responses to (p 6)	Voice different perspectives (p 7)
Gratitude	**Motivation**	**Challenges**	**Video**	**Science**	
II (2)	I - student pg 8 I pg 9	I I unfair to kids, doing the right thing I unable to express	III Reason - or feedback (3) · share II (2)		
Growth	**Language**	**Increased awareness**	**Safety**	**TORSH**	
I (1)	II - control XII (2)	III (pg 6, 7) (3)	I · safety in chaos.		

Reflect + reduce is where I'm at. Reflect more than recognise.

· voice
· routine.
· sharing routine changes c students

· relocate kids
· surprin' studen
- cam
- rout cha

Laughter - +ve and -ve stressor
IIII

Appendix P: VLC Coding Example

VLC Marie + Larissa - Iteration 1

This transcript was exported on Apr 17, 2019 - view latest version.

Domain snapshot sharing

Marie: DT/E BD — I'm gonna repeat that Larissa, I liken that to biological, so, how, I'm just interviewing Larissa now, it's the 15th of March, 2009 and she's going through a snapshot of the different domains prior to the lesson.

Larissa: Okay, so, this is how my body's responding. So my, I can feel my sort of myself tensing up and coming out of a nice calm relaxed state.

Seek clarification

Marie: C/Q — Yeah, can you just very quickly describe in a nutshell what had happened as you were lining up?

Stressor

Eg of applying strategy

Larissa: I had two students were verbally abusing each other. One was, had his hands around the other's necks trying to punch him. I had other students who were sort of trying to hang on and sort of wanting to see what was happening. And I was trying to regulate them by doing some deep breathing.

(laugh)

Marie: C - A — Yeah, okay, thank you. (laughter)

+ve stress -ve stress

Larissa: ED — So emotionally I was kind of really depleted because I am finding it quite difficult dealing with children who are off task at the moment, so just emotionally. And the day before I'd gone on an excursion with a group of kids who were just wonderful and beautiful and all of that day yesterday I dealt with children who had sworn at me and abused me and I'd had enough.

mind racing considering impact

Marie: C — Yeah, yeah.

Larissa: CD — Yes, so cognitively my mind, whenever that sort of situation happens my mind's racing because I'm thinking about, "What do I need to do with the rest of the class? What can I do with those students and how's that gonna affect the lead in to my lesson."

prompt

Marie: SD C DT/E S — Yeah. Socially, so for you socially that would be any stresses that you felt in a social context maybe with, there was another teacher I think who was there.

Larissa: Oh yes, yes.

clarifying +ve stress

Marie: SU — That might have been an element you felt you were having support in that situation.

Reframe of understanding

Larissa: Oh yeah, okay, so another way to put it, yeah.

additional adults

Marie: U S-C — It could have been, yeah.

Larissa: Yes. So it's always good when there's someone else there. The more adults there are with these children the better.

clarification

Marie: DT/E C/Q — And pro socially is that energy that you're burning through worry or through empathy that you're having, so, maybe it doesn't rank but

20190315 Larissa interview (Completed 03/17/19)
Transcript by Rev.com

Page 1 of 14

Larissa: Yes, for this instance no.

Marie: No, so that would be, yeah. Great.

CCA

Larissa: No for not this instance, I'm just gonna put that.

Explaining process and how I'd visually recorded notes for the video

AIT/E C/Q

Marie: Thanks for doing that, that's great. So what I'm going to do here now, what I've done is I've just put the minutes down the side here for the footage to give us some indication if we're finding things where to look. And then I've done some anecdotes as to what was happening at the time, if there are any times where you think that the energy you're burning in the lesson is a positive energy and you're actually feeling invigorated from what's happening we might just pop that in there. If it's something that's depleting then we'll pop in negative just at that stage of lesson that you're feeling you're burning energy and it was depleting you. I've actually added in a yes for excessive stress just on what I witnessed at the very beginning, so that I'm assuming, so you can correct me if I'm wrong, that that was a feeling of excessive stress as you entered into that lesson. And then, as I was viewing it, I started playing around with potentially which domains you were experiencing stresses in and I'll just use the first letter of each domain and I haven't got very far but I just was playing with that for my own benefit.

Example highlighting the sharing of stressors and stress responses

E C-P

Marie: I'll pop in and put annotations in later once we've taken it off the recording, so if we're putting an annotation I might just say the time so that it's easy for me to find it on here. So, here we go. The first example was, I mean you've just come in, there's been a really stressful situation outside and the positive highlight was the way you've unpacked this with the students and for both your own stresses to verbally explain how that feels to you and that you're sharing that with them. So we'll just watch that first little bit.

Exploring a strategy with students to calm

Larissa: What was the purpose of doing the breathing before coming into the classroom? So I'm asking, how does it calm us down? What is the reason it will calm us down? Jay?

Children: So when you like, come back from lunch or recess and just do it, so, you can take you can deep breathe.

Explaining science for slower breathing to students

BS

Larissa: Yes, when you slow your breathing down it slows your heart rate down. If you're in the yellow zone, I was in the yellow zone just then when I saw that aggressive behavior, my heart started to beat faster and faster. So I really needed to do that breathing with you just then, to try and get me down to the green zone. And I'm not quite at the green zone yet, but as I slow my breathing down my heart rate slows down and my mind starts to slow down as well. So I remain calm and focused.

→ voice slowing

Establishing when calm had been achieved

C/Q

Marie: So, just looking at that, what point in the lesson or if ever did you feel like you'd come down to a more regulated state.

Larissa: Probably it was after that.

C-S

Marie: Yeah you had the chimes then you had the-

Chimes - strategy

Larissa: Yeah it was during the chimes, chimes generally are really good for just giving a bit of breathing space. So generally then and the drama section it was fine.

C/PS
C DT P PP S C/QS

Marie: Yeah but it's down, it takes a little while to get everything to settle. Okay, so, yeah that was my first example and I thought you did a great job in sharing what that experience was like because that's, for you it's good to acknowledge but also for the students it's good for them to hear how. The second thing I pulled out here was the strategy. And I don't know if you did it deliberately and it's very much a music teacher thing to do is allowing the students to take charge as an almost restorative moment for you in that you're not the lead. So when you asked Angus to be the conductor.

Praise
validating
2nd example
-student Leadership

Larissa: Yeah [crosstalk 00:06:27].

Marie: CS Yeah, so I'll just play a little bit of that.

Larissa: Class you need to hold up your fingers, how many times are to play? Okay, now, this is a focus exercise because I'm looking to see how well you are focusing on Angus. And you need to concentrate how many times [crosstalk 00:06:40] you need to play. Okay. If you ring your chime when it's not your turn, I will come and take the chime off you. Before we start, who would you like to start off our performance?

laughter

laughter

Instruction

Beh-Consequence

Larissa: I chose Angus also because he gets distracted quite easily.

S

Marie: C Yeah right.

Strategy
choosing
Angus

Larissa: And he always has trouble, and I taught him last year as well. So I thought, and he was being so reasonably present today and I thought, "Okay I'll give him a go."

determinism

Marie: C Yeah.

Larissa: What I mean then, he's not rolling around on the floor. (laughter)

Potential
Stressor

Marie: DT P It reduces your stresses in the long run, I like it, okay.

Larissa: Who would you like to choose?

Children: I don't.

Marie: SU He clearly loves the job. (laughter)

Larissa: I know.

Children: Gonna start off, and then-

Larissa: We'll get whoever you chooses, so it's gonna be random. You all need to be focusing on Angus. Okay go.

↑ stressor repeating instruction accumulated stress

Larissa: IS AS Yeah and I think so, that class is generally, generally okay. But, as soon as you give a instruction, as soon as you have to repeat it you can start to kind of feel yourself escalating a little bit. And, depending on how much you've had to do it that day, depends on sort of what your tolerance level is.

clarification and prompt

Marie: CQ DQ DQ CP DQ So it is that build up effect of what that day's been like. And is that something that carries over from before the school day starts for you sometimes? Do you bring either stuff, stresses that happened before school, or from a previous day? Like, you were saying before you had a great day with an excursion and then the next day was tricky. Does it ever compound as the week continues do you feel?

end of work

Larissa: ES → AS I think sometimes yes. I think sometimes it can, yeah, no not always, but yeah sometimes it can. That feeling of being emotionally in deficit. And, generally towards the end of the week I'm always sort of less tolerant.

Marie: DQ DQ And do you have strategies that you can put in place at work to help give you sort of calm, to restore a little window of restoration before you go in? Or is the day?

Job structure
quiet space
-affirm strategies
-oils
-breathing

Larissa: Yeah I'm quite lucky in that. Because I'm not in class all the time, I can sort of go into my office and I have a few little affirmations there that I look at. So I have that, I also sometimes, I carry essential oils in my bag so sometimes I go right to the essential oils, make me feel really good. I sometimes do a little bit of breathing, I don't generally do any chair yoga. I haven't, I mean I've looked at that but I haven't kind of tried that yet. I do a little bit of breathing. I'm not, and sometimes I find.

interruption to video interview

Marie: One second, he's coming. Zahara.

Larissa: Yeah I'm being interviewed at the moment so I'll be back-

Children: The girls are looking for the [inaudible 00:21:35] do you want me to tell them where they are?

Larissa: No, I said to Marley to come up. So if Marley can come up at ten to, that would be great.

Children: Yeah.

Larissa: Thanks.

opportunities to up-regulate thru activities

Larissa: I find also sometimes doing my drumming groups or through my drama that, that kind of helps regulate, helps make me feel more positive about things if I'm feeling maybe a bit negative about students or something like that. Like, and yesterday for example before I had that class I had a girl's drumming group and I had a really bad morning with a group of students. And I was thinking, my tolerance level was at zero, below zero. Then we had the drumming group and it was really great. So the act of drumming and being with those girls was really great.

Appendix Q: Example Data Summary Page

Data analysis summary form

Data event: **Iteration 0 questionnaire**

Date: **Term 4 2018** Time: After school staff meeting

Participants: **22 teachers and teacher/administrators**

Purpose of event:

...to collect information about how teachers learn, understand, and apply new knowledge on self-regulation, and any impact this has on their own personal wellbeing and that of their students

What were the main themes/ issues?

1. Definition of self-regulation
2. Where SR knowledge has been gained and the effect this has had on practice
3. How self-regulation is being applied and perceived effect
4. Improved well-being outcomes across four cohorts (individual students, classes, self, whole school)

Summarise information you got (or failed to get) on target questions.

1. Staff have defined self-regulation predominantly through their own lens (self) when providing this definition. Locations of where self-regulation occurs/is relevant were mentioned by 2 participants. Emphasis was placed on the definition of self-regulation being on regulating emotions and behaviour. One staff member referred to other possible stressors. The idea that self-regulation required strategies was well supported with 13 counts. Control was an element that was mentioned four times. The connection between self-regulation and self-awareness arose. Reasons for self-regulation were predominantly around learning and maintaining control.
   Interesting notes on these conclusions include:
   Staff have been working with the Zones of Regulation program that focuses on emotions, this could explain the high number of responses for this element.
2. This data shows that the key sources of PL for this staff include printed programs, guest teachers, workshops and informal conversations. They have indicated that guest teachers and workshops have the largest effect on their classroom practice, followed by printed programs and reading.
   It is interesting to note that processes were not noted as a source of professional learning.
3. Application of SR: ordered according to most mentioned
   Personal (self): Application of strategies, growing awareness to body's response to stressors, considering personal stressors, awareness of effect of state on others.
   Whole class: the Zones program, teaching specific up and down regulating strategies, teaching how the brain works and coregulation.
   Individual students: 1-1 conversations, personalised up and down regulation, reframing behaviour
   Colleagues: sharing, considering stressors when communicating, collaborative planning
   Own family: sharing, considering stressors when communicating, teaching Zones language
4. Over the 4 cohorts, the use of strategies were most mentioned, followed by outcomes, the ability to recognise and identify and finally language. The most examples were given when reflecting on students

Research questions:

How	enablers	constraints	perceived difference
printed programs, guest teachers, workshops and informal conversations			Use of strategies, outcomes, ability to recognise and identify stressors, language.

Design principles:

Relationships	information	application	feedback
Consideration of others' stressors	Sharing insights printed programs, guest teachers, workshops and informal conversations	Use of strategies, outcomes, ability to recognise and identify stressors, language.	

Any other points of interest, important/illuminating?

Reframing, the effects of stress on the brain, and the five domains of stress were the most requested themes for professional learning. Workshops were the preferred way teachers wanted to learn, with video and text being options preferred by some staff.

Additional comments included gratitude for making learning accessible and interesting to students and teachers, curiosity to learn more about misbehaviour, stress behaviour and learned behaviour, and a question around how to effectively manage to large number of students with behaviour issues at the school.

Teachers had acknowledged workshops as being events at which they had gained SR knowledge (as well as printed programs and guest teachers). This aligned well with their request to receive future PL as workshops, with support videos and reading. For teachers who opted to be videoed, this had similar elements to a guest teacher in the way that this was a form of mentorship. Workshops also offer opportunity for informal conversations (which also rated highly on where knowledge had been gained).

New questions:

Relevant literature:

Look up Erickson F. (1986) Qualitative methods in research on teaching. In M.C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 119-161), New York: Macmillan

In the above reference, Erickson talks about a "generic, funnelling sampling sequence" beginning in the wider circles of a community and narrowing down. My research matches this design in the way that I engaged with all class and teachers to begin with to get a sense of the research site and its staff, then worked with the research participants (teachers and administrators), then with individual teachers. The general repeating pattern of the research was: all participants, small group of individuals, all participants. This repeated three times.

The type of sampling I used was “combination or mixed” (Miles & Huberman, 1994, p. 28). This allowed triangulation to occur providing different perspectives on the same phenomena, it provided flexibility, and it met a diversity of interests and needs within the context of the research. This type of sampling was conducive to the principles of design-based research, allowing sampling and instruments to evolve alongside the research depending of the needs and interests of what was being studied.

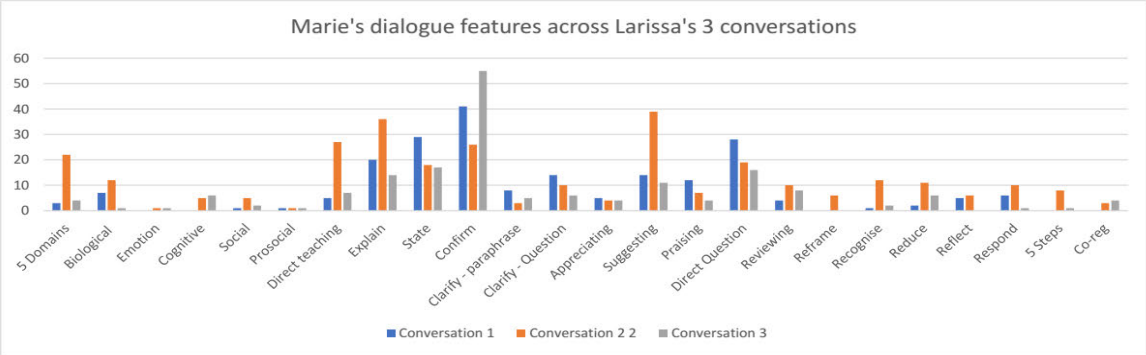
Appendix R: Larissa's Data Summary Iterations 1, 2, and 3 VLCs

Larissa Interview 1 Analysis

Marie's dialogue

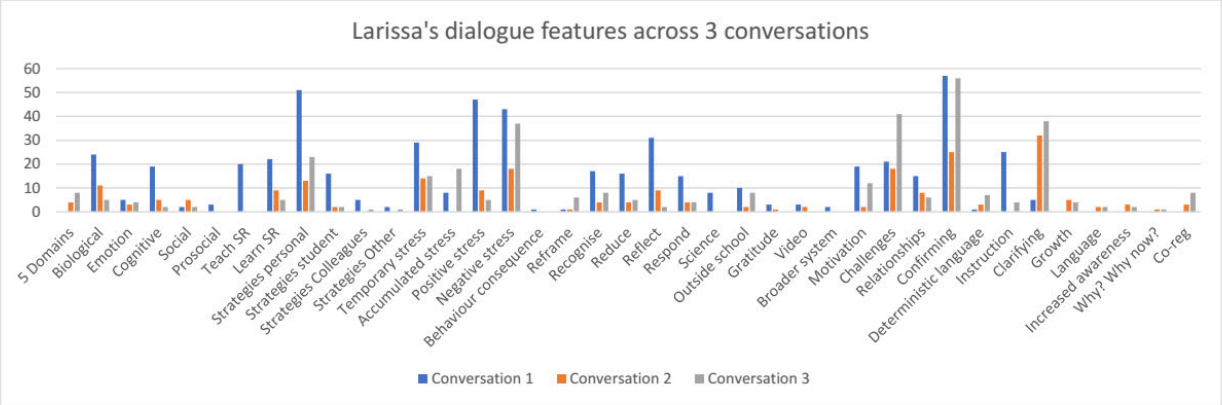
3	7	0	0	1	1	5	20	29	41	8	14	5	14	12	28	4	0	1	2	5	6
5D	BD	ED	CD	SD	PD	Dir Teach	Explain	Stating	Confirm	Clarify - Para	Clarify - Q	Appreciating	Suggesting	Praising	Direct Q	Reviewing	1Reframe	2Recognise	3Reduce	4Reflect	5Respond
22	12	1	5	5	1	27	36	18	26	3	10	4	39	7	19	10	6	12	11	6	10
4	1	1	6	2	1	7	14	17	55	5	6	4	11	4	16	8	0	2	6	0	1
5D	BD	ED	CD	SD	PD	Dir Teach	Explain	Stating	Confirm	Clarify - Para	Clarify - Q	Appreciating	Suggesting	Praising	Direct Q	Reviewing	1Reframe	2Recognise	3Reduce	4Reflect	5Respond

8	3
5Steps	Co-reg



Larissa's dialogue

5D	BD	ED	CD	SD	PD	Teach SR	Learn SR	Str P	Str S	Str C	Str O	temp stress	Acc Stress	pos stress	neg stress	behaviour	1R	2R	3R	4R	5R	Science	In school	Out of school	Gratitude	Video	Broader	Motivation	Challenges	Relationships	Confirming	deterministic	Instruction	Clarifying	Growth	Language	Increased	Why Why	C0-regulation
0	24	5	19	2	3	20	22	51	16	5	2	29	8	47	43	1	0	17	16	31	15	8	10	10	3	3	2	19	21	15	57	1	25	5					
4	11	3	5	5	0	0	9	13	2	0	0	14	0	9	18	0	1	4	4	9	4	0	0	2	1	2	0	2	18	8	25	3	0	32	5	2	3	1	4
8	5	4	2	2	0	0	5	23	2	1	1	15	18	5	37	0	6	8	5	2	4	0	0	8	0	0	0	12	41	6	56	7	4	38	4	2	2	1	8



Summary of learning conversation number one DP1 DP2 DP3 DP4

The three samples chosen for the video were to highlight Larissa self-regulating within her lesson

1. De-escalating after hallway incident and unpacking this with students (biological)
2. Allocating a student leader (prosocial) by choosing a student who often has challenges in class
3. Clapping for up regulating and attention focusing (cognitive)

Larissa described the challenges of working in this context. She gave explicit details about a physical altercation between 2 students as her lesson commenced. She describes her need to "survive" in the job with its "harrowing circumstances and tough clientele". She emphasises the impact this has on her home life as well.

She made reference to being proactive in having strategies in place BECAUSE of her work and BEFORE she begins so that she can "survive".

She also credits her learning of self-regulation as something that primarily comes from outside of work and then uses what she has learnt bringing it INTO her job. She uses the language from the Zones Program to describe how she is feeling as this is the program that was running in the school.

Larissa has a number of strategies in place to help manage stress. These include, breathing, yoga, meditation, naturopathic medicines, essential oils, affirmations, drumming group, gratitude. She is deliberate about when she uses these strategies so that she is well placed to manage what her job brings – this includes before school or planning a yoga retreat mid term.

There is a strong social thread in her conversation. In the beginning of the conversation, the social support she got from a colleague in dealing with a challenging situation was reported. Connecting with a friend/colleague for yoga retreats and instigating self-regulation practices with a small group of colleagues. There was evidence of coregulation between her and her colleague.

Self-regulation as a concept is promoted by Larissa as something that needs to be considered on a broader scale – department level as well as a community level. She knows the leaders within her school understand it's importance but sees the importance of a broader view and approach. She is driven to "speak out" for wellbeing.

Larissa finds great value in the practice of videoing teachers. She does not consider it necessary to have a pre-existing relationship with the person videoing, and is more drawn to participate due to the interest she has on the topic. She did not consider that it gave her a great insight into her self-regulation with the exception of the clapping.

Sick days are noted to be used as a coping strategy by staff when things get too much and there is great understanding for this among staff.

Stressors across the domains included:

Biological: body tensing up, heart racing, feeling weary, loud ringing of chimes hurting ears,

Emotion: emotionally depleted; emotionally in deficit

Cognitive: mind racing

Social: being sworn at and abused

Prosocial

5 Domains: “feel yourself escalating”, “generally towards the end of the week I’m always less tolerant.” “my tolerance level was at zero, below zero.”

Larissa mentioned expected stressors that she is more prepared for eg: the noise of a music lesson. These she “tolerates”.

There were 10 burst of laughter from Larissa throughout this conversation – mostly when she viewed the video.

Summary of learning conversation number two

This conversation demonstrated a deepening of Larissa's understanding of Self-reg and extended it.

Larissa indicated growth in her understanding citing the difference she noted between 3 years earlier and the present. She viewed situations differently "what do I need to do now to diffuse the situation or to calm the student" and she was asking "why is the student like that?" . Her mindset had changed, not taking student behaviour personally, and she recognised her work outside the school, personal strategies as well as the program running within the school as foundational to this growth. She also considers what is happening with her energy throughout the day.

The conversation created an opportunity to clarify the difference between the 5 practices and the 5 domains of stress and the video footage was used to connect this theoretical knowledge to what was occurring in practice for both Larissa and her students. She states, "to use something, you need to have lots of different tries of it." She felt that she had not been able to try some of the professional learning citing that she needed someone to guide and focus her on this, because otherwise, if left to her she had too many other things to think about. This conversation offered that opportunity.

Sample 1 was looking at the use of older students in art as co-regulators. Larissa indicated the need to "keep them [the students] contained" . This was an active group of younger students and she noted the change when the chaplain visited adding extra co-regulation. From this she invited the older students. Again highlighting the social element.

Sample 2 highlighted the slow careful entry the class had to the art space. Relationship building was evident in how Larissa did this. It helped reduce her stressors by building relationship and organising where students sat to support their focus.

Initial clarification and direct teaching for Larissa of the biological domain happened through viewing a student struggling with the noise in the room. Noise was identified by Larissa as something that only caused her stress if it stemmed from disengagement.

Strategies used by Larissa to reduce her own stressors in this video were:

- Older students coregulating
- Staggered entry into the classroom
- Building relationships through individual contact with students "working with those kids one on one, its really rewarding"
- Being organised for the lesson and having systems, rotations,
- Limit potential stressors (S4)
-

Teaching/ learning included:

- Clarification of self-reg terms (domains, steps)
- Considering restorative moments within a lesson.
- Considering energy burning that is invigorating vs depleting.
- Things that can be invigorating can quickly turn to being depleting
- Look for effective ways to share and learn together from the video footage.

It was also interesting to note that a biological stressor for a student like going to the toilet during the class can be a prosocial, social and cognitive stressor for the teacher. This demonstrates the complex symbiosis occurring between the energy of teachers and their students.

Summary of learning conversation number three

Note: Due to personal health circumstances I was unable to conduct this learning conversation within a few days of the video footage being taken. This conversation was held 7 weeks after the footage was taken (early in term 4 rather than later in term 3). Also important to note was that there had been a change in principal in the second half of the year)

It was noted that Larissa had been a part of the research since its inception. The stressors associated with working in this context had resulted in her seeking work elsewhere for the following year, so this was her final term. The accumulated stress had impacted her both at school and at home. Leaving was her strategy to maintain her wellbeing and remain in the teaching profession.

In the beginning of the conversation, Larissa outlined the significant stressors that the staff experience in this context and the stress behaviours that come as a result. Crying, hating work, feeling of no control (Bessel van der Kolk), vicarious trauma.

Larissa referred to strategies she knew of for social workers, relating the work she did as similar, although without the debrief that these professionals have.

Larissa also highlighted how the professional learning connected to this research impacted both her and her students citing how reframing behaviour was a new thing for her, using the five step model allowed her to see what she could do to reduce stress and seeking what was underlying the stress. This was something she planned to continue doing. She indicated that teachers at other schools may still look at behaviours as "naughty" rather than reframing them to gain a better understanding of what was going on.

To avoid teachers taking stress leaves, Larissa suggested that more space away from the children helps and that this could be a strategy that would assist resetting.

When bringing in a particular class, Larissa outlined how she attempted to maintain control, specifically when students were coming in very heightened after their recess break. She highlighted certain factors common to students from trauma backgrounds (disorganisation, low resilience to mistakes in art, the ability to persevere). Relationship building was also highlighted in the conversation.

Larissa's language showed evidence of reframing "remember they can't help it" and co-regulation.

Quotes about **the need for learning about self-regulation**

LARISSA interview 1

I'd say I started outside my work context and brought it into my work context. But I probably did that because I was thinking I need, in order to survive in a job like this, with very sort of harrowing circumstances and tough clientele, I needed to, I became aware I needed to develop Self-Reg strategies in order to survive. And, be able to sort of survive at home as well as survive here at school.

LARISSA interview 3

I think that in terms of self-regulation and being able to self-regulate yourself and putting in strategies is really important for teachers.

Quotes about **the need for self-regulation to be better understood from a department level**

LARISSA interview 1

Yeah, yes, and I'm a big, big convert for self-regulation strategies for teachers and I think it's something that the Department of Education needs to, they're not really fully aware of yet.

LARISSA interview 3

Yeah. And it's just got to the point now where this is not enough.

I was talking to a social workers, so school social workers have a boss that they report to. And they have to debrief like once a fortnight on their clients that they're seeing through the schools. And their boss makes sure, "Are you managing? What are you doing in order to look after yourself?" And I think teachers, we're going to need to have something like

Quotes about **the need for self-regulation specific to teaching**

LARISSA interview 1

Yeah, it's really, it's not like any other sort of normal office job or anything like that. And you can't just go out to the toilet if you want or you can't just go and get a cup of tea. So yeah, so it's about trying to find those moments but also sort of having the stores within yourself so when you're in the classroom all day, maybe without a break, and your Self-Regs kind of going up the wall, you need something to draw on.

Quotes about **enablers to application**

LARISSA interview 3

Yeah, more adults there are the better that is for the children

Quotes about **constrainers to application**

LARISSA interview 3

The main thing that gets in the way of you being able to apply it, is when there's just too many children who are dysregulated in one room. And you just can't, you're overwhelmed.

Quotes about **growth/ change in understanding and practice**

LARISSA interview 2

Yeah. I think I've developed quite a lot this year, but I do a lot of, I suppose preventative stuff as I've probably mentioned before outside. And I think that combined with the language that we use in the classroom around sort of green zone and regulating and taking deep breaths to calm our breathing down has made me much more aware. I suppose if I think back to maybe three years ago when I'd be frustrated by a student who's not doing what I've asked them to do, to recognize that first and then, okay, I'm not going to take it personally. What do I need to do now to diffuse the situation or to calm the student or you know, why is the student like that? So yeah, I think I react far less.

Up till now I have never thought consciously about these teaching moments as being restorative, but I can absolutely see that they are, I think I will that away now, something that I've learned.

LARISSA interview 3

I've been doing my teacher's registration and so I had to write about professional learnings I'd been doing and how that's impacted me, and what impact it's had on my learning but also on the students and stuff. And so I included this as I've done two PLs, and this was the main one. And I was speaking about how reframing the behaviour has been a new thing for me.

And looking at that five step model to see what I can do to reduce the stress and what's underlying it and that kind of thing. So I think that's really, really important and I'll kind of just always keep on doing that.

(evidence of language shift) And I think probably for lots of teachers who work in more middle class schools that don't have that understanding, they probably still look at it as naughty behavior, rather than trying to reframe it and understanding what's ... yeah

Quotes about **applying learning**

LARISSA interview 2

To use something, you need to have lots of different tries of it,

I think I need someone else to kind of say, right, okay, let's think about this. Whereas if it's just left to me, well then I'm thinking about too many other things.

Quotes about **energy depletion**

LARISSA interview 2

..if I've lost my temper with a student or whatever, like I feel it depletes me emotionally and my energy. You feel disappointed in yourself and also just using that negative energies, you know, it's not good.

LARISSA interview 3

If you're really tired and burnt out, you sometimes can't even be bothered to self regulate. You just kind of start crying.

Quotes about **being proactive**

LARISSA interview 2

I think for me it's just kind of trying to be ahead to limit potential stressors that I know of.

Quotes about **invigorating stressors**

LARISSA interview 2

But there's also emotional stressors in that, in a good way, in that through working with those kids one on one, it's a really rewarding experience.

Quotes about the **accumulative nature of the stressors of this context**

LARISSA Interview 3

Yeah, well quite frankly in this context we need to do a lot of self-regulation and not even all the self-regulation in the world kind of is keeping us kind of under control really at the moment. I think there's a lot of us who are very impacted, yeah, by kids in the classroom. And yeah, we're all in the negative rather than the positive.

And I think teachers, we're going to need to have something like that because a lot of us are just taking too much on and needing to act in ways like social workers, but we don't have any means of debriefing.

(in response to why she was leaving the school) Oh, to manage my wellbeing and that of my family as well. And I think I would probably give up teaching if I was working here next year.

And what happens is I think the burnout effects of even dealing with this ... so this is a calm classroom, but having that kind of attention, you're having to do that all the time, non-stop. That's the detrimental effect, even on a good day, and that a good day, is when you go home, you're completely burnt out because you just had people at you the whole time. And you're just giving out the whole time.

Yeah. So it's still very depleting even when it's calm because you're having to give so much of yourself.

Quotes comparing **self-regulation in other contexts to this context**

LARISSA interview 3

And I think probably for lots of teachers who work in more middle class schools that don't have that understanding, they probably still look at it as naughty behaviour, rather than trying to reframe it and understanding what's ... yeah.

Quotes of **evidence of stressors**

LARISSA interview 3

So staff members crying every day is normal.

Staff members saying that they hate their job, they hate working here. Kind of feel that they have no control over things. So you can still kind of apply, even in most chaotic situations, so you can still try and sort of go, "Okay, I'm going to try and just self regulate myself so I don't completely burn out here. Like in this second while I've got 10 kids throwing chairs, and two kids running around on desks and whatever." But yeah, a lot of us I think have been affected too much by vicarious trauma.

Therefore I always feel a bit anxious about how much I will need to control if, I can control the students.

Quotes of **deficit discourse**

LARISSA interview 3

So looking for student work is always stressful because also with these kids, kids with trauma don't have organizational skills.

Quotes about **suggestions of how to restore so that stressors can be managed**

LARISSA interview 3

I think having more space away from the children helps. Like anything when you have time away it gives you that ability to reset, which is why teachers take stress leave, because it gives them that time. So maybe four classes that are really, really challenging. And I don't know how you do it, but allowing teachers more space away.

Quotes about **design principles**

MARIE interview 3 with Larissa

That's really valuable insight. And something, when I'm looking to develop design principles and professional learning in this space, to go up that next level and have that be an additional piece that's needed-

Quotes about the **importance of relationships**

LARISSA interview 3

Yeah. Spending a lot of time with him because he's particularly dysregulated kid.