From Paper to Practice: Educator Understanding and Facilitation of Self-Regulation in the Kindergarten Classroom

Doctoral Dissertation

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Abstract

There is growing concern about the mental health and resilience of today's students (McCain, Mustard, and Shanker, 2007) and difficulties with self-regulation as part of human development are implicated in educational outcomes, cognitive problems, internalizing problems such as depression and anxiety, externalizing problems such as aggression, and physical health problems (McCain et al, 2007; Shanker, 2010). Self-regulation is a growing topic of interest in a variety of disciplines including education. With over 42 961 peer reviewed journal articles which use the term "self-regulation", it is not surprising that there are 447 different interpretations of what self-regulation means in the literature (Burman et al., 2015), which makes it difficult for educators to interpret and apply it in their respective classrooms. Due to recent advances in neuroscience, the Ontario Ministry of Education shifted towards a neurophysiological framework on the Self-Regulation and Well-Being Frame of the Kindergarten Program. The current study examined which frameworks kindergarten educators were using by analyzing the ways they described and facilitated self-regulation in the classroom within a school board in northern Ontario through surveys, interviews, progress reports, and classroom observations. Findings revealed that educators: have little experience and training with resources aligned with the Kindergarten Program's approach to self-regulation, describe self-regulation as self-control, and facilitate self-regulation using a learning strategies approach. Educators were observed using fewer than a third of ministry self-regulation recommendations in the classroom. Implications and recommendations for aligning educator practices with the Kindergarten Program's framework are discussed, including the limitations of pre-packaged programs currently in use and the advantages of adopting a neurophysiological approach to understanding self-regulation.

Keywords: self-regulation; self-reg; kindergarten; neurophysiology; well-being; student-teacher relationships; classroom environment; programs; facilitation; professional development.

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Chapter 1: Introduction

There is growing concern about the mental health and resilience of today's students (McCain, Mustard, and Shanker, 2007). In Ontario, 27% of children have learning, health, or behaviour problems based on their vulnerability upon entering first grade (Janus et al., 2012). Some researchers suggest that difficulties with self-regulation as part of human development are implicated in educational outcomes, cognitive problems, internalizing problems such as depression and anxiety, externalizing problems such as aggression, and physical health problems like cardiovascular diseases, autoimmune diseases, and cancer (McCain et al, 2007; Shanker, 2010). Others agree—Forgas, Baumeister, and Tice (2009) suggest that many of the related challenges we see in our ever-evolving society involve those of self-regulation including: eating disorders, obesity, underachievement, unplanned pregnancy, sexually transmitted infections, financial difficulties, gambling, and domestic abuse, among others. As such, Forgas et al (2009) note that the construct of self-regulation and its connection to well-being is increasingly prevalent in the psychological research literature, including the related areas of emotion, mental health, prejudice, aggression, crime, physical health, eating, addictions, learning, and more. My search of the ERIC education database and psychology databases PSYCInfo and PSYCArticles yielded 42 961 peer reviewed journal articles using the term "self-regulation". Forty-two percent of these were from the past five years of research. Self-regulation is a quickly growing topic of interest in contemporary education and the field of psychology.

With all these differing definitions of the construct, how is an educator to determine what self-regulation is and how it should be embodied, facilitated, taught, modeled, and measured? It may be that educators could better understand and benefit from a uniform definition in order to guide their practice in facilitating self-regulation. Recognizing this need, the Ontario Ministry of

Education adopted a specific neurophysiological definition (one's ability to manage energy and tension) as described throughout the reports and documentation leading up to the recently published *Kindergarten Program* (Best Start Expert Panel on Early Learning, 2007; Government of Ontario, 2014; Janus et al., 2012; McCain et al., 2007, 2011; McCain & Mustard, 1999). The strong foundational literature leading to their choice to employ this definition will be delineated in Chapter 2.

Educators who read the research and professional literature on self-regulation will encounter a wide variety of assessments, strategies, and interventions (outlined in Chapter 2), which may lead to a spectrum of approaches and programs used by educators in their classrooms despite Ontario's documentation that a neurophysiological model has been adopted. Educators' understanding of a consistent definition and framework for self-regulation approaches may help them to understand how to facilitate a self-regulation process in their classrooms through the structure of their learning environments and their interactions with their students. However, there are no studies that have emerged looking at how educators understand and facilitate self-regulation, which would be an important step towards the implementation of common classroom practices across the province that align with Ontario's adopted definition.

1.2. Differentiating Programs from Frameworks

When Kindergarten educators seek guidance to better understand how to support their students' ability to self-regulate, they will find proscribed programs and theoretical frameworks. A program is a set of step-by-step instructions delineating what an educator can do (e.g., lessons, strategies). A framework, on the other hand, is the philosophical foundation influencing what an educator does. A framework guides the ways educators plan, facilitate, and assess. A framework isn't about what to do, but rather about how to think. For example, when an educator understands

why behaviour is happening (i.e. stress), they may be more willing to adopt recommended interventions (Andreou & Rapti, 2010; Bibou-Nakou et al., 2000). In contrast, educators who believe that behaviour is under a child's control may be less likely to believe in successful intervention outcomes (Reyna & Weiner, 2001). Thus, understanding misbehaviour as stress behaviour may change educators' attitudes and approaches towards facilitating self-regulation in the classroom.

Recent advances in neuroscience suggest that educators may see better results in facilitating self-regulation with a neurophysiological framework for approaching classroom challenges of internalizing behaviours (i.e., mental health), externalizing behaviour (i.e., aggression), and other aspects of well-being (Clinton, 2014, 2020; Delahooke, 2019; Greene, 2007; Greenspan, 2007; Shanker, 2016; Tranter et al., 2018). When creating their new *Kindergarten Program*, the Ontario Ministry of Education was interested in how self-regulation could be facilitated within schools to target some of children's mental health, behavioural, and cognitive challenges. They selected a neurophysiological framework for facilitating self-regulation based on the neurophysiological definition as one's body's ability to respond to stress and to manage energy and tension. The selection of this framework was based on many large scale studies and reports on child development, self-regulation, and well-being developed by leading researchers who were focused on a neurophysiological approach including Fraser Mustard, Stuart Shanker, Charles Pascal, and Jean Clinton (Best Start Expert Panel on Early Learning, 2007; Government of Ontario, 2014; McCain et al., 2007, 2011; McCain & Mustard, 1999; Pascal, 2009). The Ministry regularly referenced the work of Dr. Stuart Shanker throughout the kindergarten documentation and professional development resources pertaining to self-regulation, particularly his framework for facilitating self-regulation (Ontario Ministry of

Education, 2016b). Shanker (2010, 2012, 2016) describes a comprehensive five-domain framework defining self-regulation as the process by which people respond to and recover from stressors and manage energy and tension, a framework richly grounded in neurophysiology, which will be examined in more detail in Chapter 2 in comparison with other potential definitions of self-regulation and their relevant frameworks. This framework was used throughout the current study as the Ministry's adopted framework for understanding and guiding facilitation of self-regulation.

There are a number of self-regulation frameworks available, and despite Shanker (2016) being the Ministry's preference, it has not yet been determined which frameworks educators are actually using to guide their practice in facilitating self-regulation in the classroom. Are teachers using a framework to guide their practice, or are they using pre-packaged, behaviourally-based programs which may be based on philosophical frameworks that do not align with the *Kindergarten Program's* (2016b) neurophysiological framework?

1.3. Importance and Relevance of the Study

Sabol and Pianta (2012) suggest that a framework founded on relationships (such as Developmental Systems Theory) is critical for human development especially in the early years, as the student-teacher relationship is significantly more impactful for mitigating poor outcomes like externalizing behaviours and aggression than the curriculum itself. The importance of a developmental neurophysiological framework to long-term outcomes of internalizing and externalizing problems will be discussed throughout the current study. I examine the types of frameworks or programs kindergarten educators are using by examining the ways they describe and facilitate self-regulation in the classroom within a school board in northern Ontario through

the use of evidence collected from surveys, observations, interviews, and Communications of Learning (progress reports).

Kindergarten educators can have a tremendous impact on their students' trajectories, depending on the framework they adopt. This study will critically analyze the types of outcomes (behavioural, developmental, academic) educators are prioritizing and the facilitation methods they subsequently choose based on the specific framework of self-regulation that they adopt. For example, there has been an increased focus in the research on relationship processes (an educator's ability to read a child's cues, respond to their signals, and provide safe support when needed) in the past two decades (Greenspan, 2007; Malaguzzi, 2016), and professional development has begun to shift away from informational program-based professional development experiences toward relational, process oriented ones, with roots in an attachment framework, in order to improve teacher-child relationships (Sabol & Pianta, 2012). This study intends to better understand educators' roles in facilitating self-regulation as a foundational construct to human development.

The data collection tools I created for my research study can help to provide information about how educators currently understand and implement self-regulation (including the environment, relationships, and lessons used to facilitate), using the Ministry's adopted self-regulation framework as a reference point. This information may in turn impact how administrators support educators to effectively support self-regulation in their classrooms and impact long-term trajectories and outcomes. This data can inform stakeholders about which means of supporting educators may be / have been most effective in sharing the Ministry of Education's framework (ways of thinking about self-regulation and behaviour), impact student

outcomes, and hopefully provide the support that teachers need in their increasingly stressful, yet incredibly important, role.

1.4. Working Definitions

For the purposes of clarity, the following working definitions are adopted in this dissertation:

Approach: The strategies educators use to facilitate the learning of a skill or outcome; a facilitation style based on a specific framework.

Behavioural approach: Strategies based on the ABC (antecedent, behaviour, consequence) framework for understanding and changing behaviour through manipulating antecedents and consequences.

Framework: A theoretical structure for thinking about self-regulation including the underlying philosophies which guide prioritization of outcomes as well as facilitation and assessment (e.g., Shanker's Self-Reg framework of five principles and five domains of stressors).

Neurophysiology – A branch of neuroscience and physiology focused on the functioning of the nervous system's stress response.

Self-Regulation: The process by which we respond to and recover from stressors and manage our energy and tension, which is based on an underlying philosophy of neurophysiology (how the brain and body physically work together to respond to stressors).

In addition, because of the large number of definitions and interpretations of self-regulation available in the literature, the following categories of definitional interpretations related to self-regulation, as described by Burman et al (2015), will be described at the beginning of Chapter 2: learning strategies, agency, social behaviour, self-monitoring, self-management, and self-control.

Chapter 2: Literature Review

There are 447 different interpretations of what self-regulation means (across 6 broad categories) in the literature (Burman et al., 2015), which makes it very difficult for educators to have a common understanding of self-regulation. Following recent advances in neuroscience, the Ontario Ministry of Education shifted towards a neurophysiological framework on the Self-Regulation and Well-Being Frame of the *Kindergarten Program* (2016b). The shift leaves questions about which frameworks teachers are, and could be, adopting to guide their embodiment of self-regulation within their classrooms. What do educators think self-regulation is and how do they facilitate it in their classrooms? What categories of definitions are they using to guide their practices? This chapter examines these differing definitions and how they fit into the context of Ontario's *Kindergarten Program* (Ontario Ministry of Education, 2016b).

2.1. Definitions of Self-Regulation in the Literature

Because the interest in self-regulation and what it means is ever growing, the increasingly large body of literature focused on self-regulation includes hundreds of perspectives on its definition and valid measurement (Burman et al., 2015). When the literature contains multiple definitions, a variety of strategies and approaches, and differing assessments, it potentially creates confusion for educators who are implementing self-regulation strategies. It may be difficult for educators to select strategies for their classrooms due to the wide range of approaches supported in the literature. It is important to understand the definition of self-regulation in the *Kindergarten Program* (2016b) in order to apply the definition to the classroom setting in ways that are practical for classroom educators.

Burman, Green, and Shanker (2015) used techniques from the Digital Humanities to identify 447 different uses of the term "self-regulation" in PSYCnet's Term Finder. They then

quantified a visual network of related terminology (see Figure 1) and identified the most influential meanings provided for the term ‘self-regulation’. The authors defined the discourses for discussion and research applications and eliminated unreliable definitions, revealing six clusters as follows:

Learning / Learning Strategies: This interpretation involves such related concepts as cooperative learning, trial and error learning, metacognitive strategies, constant time delay, study habits, and time spent on task.

Agency / Self-Determination / Internal External Locus of Control / Helplessness: This interpretation involves volition, interpersonal control, self-determination, coping behaviour, and independence.

Social Behaviour: This interpretation involves social and psychodynamic behaviours regulated by the individual.

Self-monitoring (Personality; including self-perception, personality traits, reflectiveness, and personality): This interpretation involves self-perception, self-concept, self-esteem, reflectiveness, introspection, perfectionism, and common personality models.

Self-monitoring / self-management including self-evaluation and behaviour modification: This interpretation involves cognitive techniques, self-instructional training, cognitive behaviour therapy, anxiety management, behaviour modification, and other psychotherapeutic techniques.

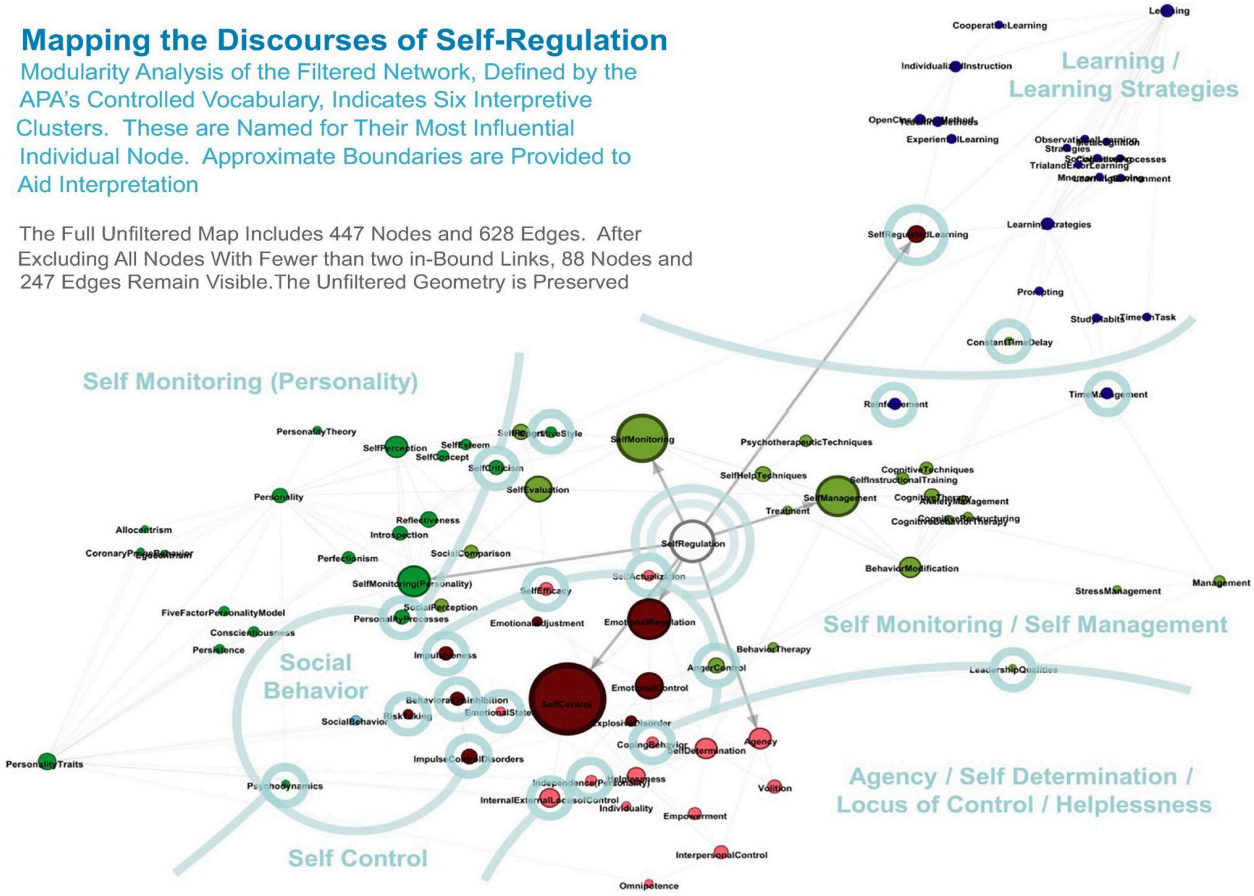
Self-Control (including emotional regulation and emotional control): This interpretation involves the intentional regulation of emotions, inhibition of impulses,

emotional adjustment, behavioural inhibition, explosive and impulse control disorders, and emotional control.

The original neurophysiological definition of self-regulation, Burman found, lies at the center of them all, as seen in Figure 1, with many overlaps and related but distinct constructs branching out from this central definition. With such a range of meanings, researchers need to identify which construct is being targeted and to be clear on its relationship within this network of related terms to make valid conclusions about how to best support self-regulation.

Figure 1

Burman, Green and Shanker's (2016) Network of Self-Regulation Definitions



Burman et al. (2015) contributed to narrowing the focus and clarifying the meaning of self-regulation while preserving the connectedness of similar yet relevant constructs (such as learning/learning strategies). Burman analyzed the connectedness of the terms to look at communities of similarities and quantified estimates of the most influential meanings to reduce the number of parts while preserving the integrity of the whole. Willpower, focus, and grit (i.e., self-control), emerged as the most predominant understanding of self-regulation (Burman et al, 2015). However, Burman argues that self-regulation is much more complicated than management or control. Burman et al (2015) concluded that understanding that self-regulation is not simply volitional/conscious self-control of behaviour is important to changing one's approach in the classroom. They suggested that educators who understand self-regulation in this way would be less focused on control of behaviour through rewards and punishments and more focused on constructive interactions to more easily encourage self-regulation with better outcomes. Similarly, when educators believe behaviours are under the child's conscious control, they resort to punitive (Dagnan et al., 1998) and reactive responses to behaviour such as time-out and loss of privileges (Nungesser & Watkins, 2005).

Why are there so many different interpretations of the term, 'self-regulation'? Post, Boyer, and Brett (2006) discovered a paradigm shift (or perhaps a revolution) over the last seven decades in how the term 'self-regulation' has been used in the literature, from seeing self-regulation through a behavioural self-control lens, then a cognitive lens, and now a more contemporary approach with a biological component, thus expanding the number of definitions—essentially, a paradigm revolution.

2.1.1. A Paradigm Revolution in Child Development: An Early History of Theory

Ontario has seen a reframing of pedagogical approaches to kindergarten curriculum over the last two decades due to recent advances in neuroscience (Pascal, 2009). For example, the *Kindergarten Program* (Ontario Ministry of Education, 2016b) has reframed misbehaviour to describe it instead as stress behaviour. Shanker and Burgess (2017) suggest that 'reframing' is a new way of looking at an idea or concept that can help us to understand other perspectives, research findings, and research applications. In child development, for example, Freud and his psychosexual theory were once the dominant voice in human lifespan development and Piaget's later influence was uncontested, but it is commonly known that their impact and interpretations have shifted through the years. Compliance and will were key components of behaviour-based frameworks of child development prior to the 1950s, but a shift to cognition and its influence on human development became evident from the 1950's to the 1990's.

Post et al (2006) used content and archival analysis to examine self-regulation specifically in the developmental psychology literature as a subject area (focusing on self-regulation, compliance, self-control, self-management, and self-monitoring), finding four distinct time periods in the study of self-regulation. They found a *precursory period* before 1950 that focused on a behavioural self-control perspective which was tied to a psychoanalytic view of human drives focused on gratification and pain avoidance, combining Freudian and Pavlovian theories. An *emergent period* followed from 1950 to 1970 and reflected the emergence of cognitive science while still retaining some of the behavioural theory connected to learning and self-control, which included investigations of self-rewards and incentives, delay of gratification, and social compliance. This led to the emergence of *early cognitive theory*, and its connection to the self-regulation literature became influenced by theorists such as Jean Piaget and Lev

Vygotsky. Following this, a *contemporary period* occurred between 1970 and 1990, looking at the difference between behaviouristic determinism and humanistic volition - nature and nurture. This time period involved a reconsideration of earlier perspectives regarding different stages of development, social learning, goal setting, and information processing.

Beyond 1990, research that expanded on behaviour and cognition research found self-regulation to be linked to every category of psychology across many contexts and definitions (Post et al., 2006). Bjorklund (2018) proposed that the field of child development was in need of a new metatheory (broad, overarching assumptions and principles) to unify the field, and that evolutionary developmental psychology could provide such a metatheory. He suggested that there had been an increased influence of neurophysiology on developmental psychology in the previous two decades such as the effects of hormones and genetics on behaviour, epigenetics, and the emergence of developmental neurophysiology. In fact, Byrnes and Fox (1998) predicted that just as the cognitive revolution replaced behaviourism as a dominant paradigm, a revolution towards developmental neurophysiology would occur. This *expansionist period* indeed showed a tremendous increase in the literature in developmental neurophysiology, including the effects of the environment on the developing brain (Marshall, 2015) as well as the social, emotional, behavioural, cognitive, and experiential fields of self-regulation (Post et al, 2006). Dr. Robin Williams, in her foreword to Jean Clinton's book, *Love Builds Brains* (Clinton, 2020) described how in the early 1990's, there was a rapid evolution of how researchers understood behavioural and learning issues. Professionals were moving away from behavioural or cognitive approaches and towards neurophysiological approaches with an increasing focus on early development, brain function and their impact on health and well-being outcomes. Boyce's *The Orchid and the Dandelion* (Boyce, 2019) took the blame off the child for behaviour and learning challenges and

highlighted the importance of a specific and nurturing environment for some children. Similarly, Gopnik's (2016) *The Gardener and the Carpenter* purported that adults can support child development by nurturing the environmental conditions allowing them to flourish naturally, rather than creating a plan and creating their lives according to a structured plan.

Despite this growth in research and understanding of neurophysiological approaches, the dominant paradigms guiding early educational policy and implementation often remained behavioural or cognitive in focus (Post et al., 2006), and thus focused on behaviour management outcomes rather than well-being and vulnerability. Recent studies have shown that teacher understanding of the reasons underlying behaviour can impact their willingness to adopt recommended interventions (Andreou & Rapti, 2010; Bibou-Nakou et al., 2000). Furthermore, educators who believed that behaviour is under a child's control were less likely to believe in successful intervention outcomes (Reyna & Weiner, 2001). The Ministry of Education's shift away from predominantly behavioural or cognitively based frameworks in the *Kindergarten Program* towards a neurophysiological framework was founded on the neurophysiology underlying contemporary understandings of self-regulation (Ontario Ministry of Education, 2016b).

2.1.2. Evolutionary Psychology and Neurophysiology – A Fitting Foundation for Self-Regulation

While the psychological components of self-regulation are varied, many researchers now agree that they all have as their foundation a biological connection (Greenspan & Shanker, 2004; McCain & Mustard, 1999; Porges, 2011, 2015). Contemporary researchers such as Stephen Porges are focused on the brain-body connection—the human capacity to manage and recover from stress which affects one's ability to learn and connect with others, which is critical to

human development. Porges (2015) argues that psychologists have been actively measuring such constructs as stress without attending to the human's natural and biological need to feel safe, which is the true foundation of self-regulation.

Porges (2011) elaborates on this contention describing how risk and safety cues that are continually monitored by our nervous systems influence our physiology and psychology. Our nervous systems influence our ability to remain in a calm, alert, self-regulated state, our behaviour, and our health. The nervous systems of mammals developed for survival in life-threatening situations and to promote social interaction in safe environments (Porges & Furman, 2011). Every animal has an autonomic nervous system, including a pathway called the vagus that connects its brain to its body to regulate body functions like digestion and cardiovascular function. It prepares the body for flight, fight, or freeze modes for survival under perceived threat. Mammals have developed a secondary adaptive pathway of the vagus nerve that is responsible for cardiovascular functions as well as those necessary for regulating the face, head, and neck, forming an integrated 'social engagement system' (Porges & Furman, 2011). The social engagement system, unique to mammals, allows us to use social cues to signal safety to ourselves and others, such as an infant's attempts to engage the caregiver and explore social reciprocity as a mechanism to self-regulate to allow his body to physically rest and restore. In contrast, the facial and vocal features of a stranger might lead to mobilizing, protesting, and defensive behaviours (Porges & Furman, 2011). Engaging in more adaptive social behaviour regulates the nervous system so there is less need for more primitive defense strategies (fight-flight/freeze) as a child develops (Porges & Furman, 2011).

Maclean (1985) agreed with Porges', with Maclean arguing that the field of psychiatry had been naïve in trying to treat something as complex as brain-based disorders and resultant

behaviours with medications when the term psychiatry itself literally means ‘mind healing’. He pointed out that many scientific fields (neuroanatomy, ontogeny, phylogeny, paleontology) together demonstrated that the human forebrain (prefrontal cortex) has evolved and yet the human brain structure still retains neural assemblies that reflect nervous system assemblies related to: 1) reptiles, 2) early mammals, and 3) late mammals, with these three assemblies forming what he calls a *triune brain metaphor*. While the triune brain metaphor is an oversimplification of the very complex brain of which he speaks, it allows us to think differently about behaviour. The triune brain metaphor allows us to look at how our brain states work to keep us mentally and physically safe. It lets us reframe the source of given behavioural responses from conscious, frontal lobe *choices* to unconscious, limbic, protective, fight/flight *responses*. The human brain’s prefrontal cortex allows us to think and consciously use a variety of strategies to relax and recover from stress via symbolic language. However, Maclean (1985) pointed out that we still have the inborn assemblies of our brains such as our limbic systems and basal ganglia (reptilian complex, or “R-complex”) which are connected to unconscious responses including emotional safety such as that within a family, and more primal or reptilian displays such as territory, courtship, or submission. When these earlier evolved portions of our brains, (the limbic system and the R-Complex), do not perceive safety cues, the newer portion of our brains, (the neo-mammalian, or prefrontal cortex where we think and plan and learn and connect to others), does not fully engage – it is secondary to our evolutionary need for safety. In simpler terms, Maclean’s theory suggests that sometimes we react unconsciously *before* we think; an instinct to protect ourselves from stress or danger that is not a conscious behavioural choice.

Similarly, Montag and Panksepp (2017) highlight an affective neurophysiological approach to personality, and argue that individual differences in the emotional systems may

represent the phylogenetically oldest parts of our brains. Building upon Maclean's triune brain theory (a metaphor for various brain states), Montag and Panksepp describe the theory of how the brain is comprised of the reptilian, or deep subcortical brain, the old mammalian brain (limbic), and the neo-mammalian (cortical) brain regions. The reptilian brain represents automatic functions such as breathing and heartbeat regulation as well as basic survival-based emotions (fear, lust, rage). The limbic brain is mainly responsible for emotions related to maternal care, separation distress, and play. Our neo-mammalian cortex helps us to cognitively regulate our emotional responses, but this cognitive regulation (conscious thought processes) cannot effectively operate without the subcortical processes being regulated.

The developmental aspect of higher-level cognitive regulation is unique to humans. Human babies are essentially fetuses outside the womb for about the first 9 months of life (Gould, 1977). For humans to have evolved to become bipedal and develop larger and more complex brains, it became necessary for their children to be born earlier in the gestation period. About 40 weeks' gestation became the maximum gestation period allowing a baby to pass through the birth canal without an overhaul of the female anatomy (Gould, 1977). Much of the brain develops after birth in those first nine months, with tremendous growth and brain connections occurring which are critically dependent on the environment and human interactions during this time (Gould, 1977). Around eight months of age, the excess connections begin to prune away, and by the time a child is 6.5 years old, about 95 percent of his/her brain is developed (Gould, 1977). During these first few years, a child develops his/her stress reactivity system, which underpins language, emotional development, social development, thinking and behaviour (Loman & Gunnar, 2010), so it makes sense to use a more complex dynamic systems framework of human development rather than a more linear, behaviourally-based framework to

support effective and holistic human development and lifelong well-being. This shift in thinking away from behavioural and cognitive frameworks towards neurophysiological ones has been seen over the last 50 years of research (Post, 2009)

2.1.3. A Shift to a Neurophysiological Approach

A *dynamic systems approach* involves using interdisciplinary principles and diverse science to understand the complexities of our world with a focus on the importance of human connections and relationships to development (Fogel et al., 2008). It is said to be dynamic because it changes over time. Relationships are dynamic systems because they change over time, and together create something that is more than the sum of what either of them is in isolation. Behavioural child development theories such as those proposed by Watson (1913) and Skinner (1957) framed child development in the context that all behaviours are measurable, and learned through stimuli in the environment. Watson's as well as Skinner's guiding principles underlie the evidence base that led to policies and programs focused on behaviour management programs. While there is a strong and publicly known evidence base that behaviour change is possible through behavioural approaches, some researchers have reported a continuing increase in behaviour and related developmental challenges for children. Achenbach and Howell (1993) found an increase in child behaviour problems in the home and classroom across a fifteen-year period. Data from the Early Development Instrument (EDI) in Ontario demonstrated increases in educator reports of aggression, hyperactivity, and inattention (Offord Centre for Child Studies, 2017). Furthermore, a report by Primary Sources (a project representing the views of more than 20,000 public school teachers) indicated that teachers feel that behaviour management is one of the most time consuming aspects of teaching (Primary Sources, 2013). Even though behavioural intervention and support continue to be prevalent in research and practice, perhaps behaviour

problems continue to increase because human development does not occur through manipulating elicited milestone responses nor controlling behaviours extrinsically, but instead through the more complex development of relationships that set the stage for safety and well-being. Jean Clinton, a child psychiatrist who has worked with Dr. Fraser Mustard and the Honourable Margaret McCain on the Early Years task force, and as an advisor to the Ontario Premier and Ministry of Education, talks about the importance of moving away from what she calls the tyranny of cognitive seduction (focusing too much on cognition and academics) and towards developing relationships where we connect before we correct (Clinton, 2020). Relationship development may be more critical to holistic development than milestones or skill mastery, and in fact, may make milestones / skill mastery occur more naturally, which is perhaps why it is such a large part of Ontario's *Kindergarten Program* (Primary Sources, 2013). Furthermore, one of the challenges in the use of lenses like self-control is that these lenses do not necessarily acknowledge the changing nature of the individual on a moment-to-moment, day-to day basis or throughout the lifespan. A dynamic systems theory explains how the various parts of a system are interdependent. In the case of human lifespan development, this includes the many aspects (biological, emotional, cognitive, social, and prosocial) that contribute to success and challenges, mental and physical health and well-being.

Self-regulation is not about behaviour or emotional control, but instead about a dynamic and balanced system relevant to the social engagement system (relationships) and its role in the stress response system. A decade of research on these advances in neuroscience culminated in several key reports which demonstrated Ontario's emergent shift towards a neurophysiological approach for defining self-regulation. These reports led to the development and initiation of Ontario's full day *Kindergarten Program* which includes a prominent self-regulation focus

throughout (Ontario Ministry of Education, 2016b). The definition of the Ontario *Kindergarten Program*'s Self-Regulation frame is neurophysiological and aligns with Shanker's framework of self-regulation which is thus the foundation of the current study. The next section details how this definition came to be adopted in the Ontario *Kindergarten Program*.

2.2. The Ontario Response to Recent Advances in Neurophysiology

Researchers McCain and Mustard (1999) argue that today's families are experiencing significant stress in this period of economic and social change, and universal support in the critical early years is needed to help manage well-being and long term outcomes. In response to these challenges, Ontario commissioned a series of reports and studies (Table 1) to determine how to move forward in targeting these challenges within Ontario's classrooms. The advances in thinking and practice resulting from each of these documents will be addressed further in Sections 2.2.1 to 2.2.7 below.

Table 1

Documents Foundational to the Development of Ontario's Kindergarten Program

Date	Publication
1999	Reversing the Real Brain Drain: Early Years Study 1 (McCain & Mustard, 1999)
2007	The Early Years Study 2 (McCain et al, 2007)
2007	Early Learning for Every Child Today (ELECT; Best Start Expert Panel on Early Learning, 2007)
2008	Full-Day Kindergarten: Moving Ontario Forward (Elementary Teachers' Federation of Ontario, 2008)
2011	The Early Years Study 3
2016	The *Kindergarten Program* (Ontario Ministry of Education, 2016b)
2016	Growing Success – The Kindergarten Addendum (Ontario Ministry of Education, 2016a)
2020	Early Years Study 4: Thriving Kids, Thriving Society (McCain, 2020)

2.2.1. Reversing The Real Brain Drain: Early Years Study 1

In 1999, Ontario's Minister Responsible for Children began to examine evidence from developmental psychology and neuroscience among other disciplines for relationships among brain development, learning, behaviour, and health across the lifespan. They found evidence of the critical importance of early childhood development in better long-term outcomes for children (McCain & Mustard, 1999). McCain and Mustard's (1999) study, *Reversing the Real Brain Drain: Early Years Study 1* and its follow-up documents (McCain et al., 2007, 2011; McCain & Mustard, 2002) indicated that studies in neuroscience and epidemiology have continued to demonstrate the connection between the neurological stress pathway and behaviour, physical and mental health, anxiety, substance abuse, and other problems later in life.

The Early Years Study (McCain and Mustard, 1999) was a report summarizing empirical research in contemporary neuroscience, which explained why countless studies had been confirming a deterministic view—that when a child enters the school system, his/her educational future already seems decided. They reported that researchers had found that highly verbal and attentive children (upon school entry) go on to achieve successful educational outcomes, and those with poor language and social skills find school stressful and often develop behavioural, psychological, and physical problems (McCain et al., 2007). These later difficulties can result in interventions that treat the behavioural, psychological, and physical 'symptoms'. Educators' interventions such as prompting and reinforcing desired behaviours had been mostly unsuccessful at changing this trajectory (McCain & Mustard, 2002) and they were looking for answers.

McCain et al (2007) suggested that The Early Years Study (McCain & Mustard, 1999) had a powerful impact on some educators' deterministic way of thinking, showing that specific

early school experiences have very far-reaching effects on children's core capacities and developmental trajectories. The Early Years Study argued that teachers could impact positive developmental change through an upstream neurophysiological approach to child development (looking at the causes and risk factors of stress) rather than focusing on the much more expensive and less efficient downstream effects (looking at the consequences or symptoms) of behaviour challenges in the classroom (McCain & Mustard, 1999). The Early Years Study was built upon the evidence from neuroscience that early development, from conception to age 6, sets a foundation of competence and coping that will affect lifelong learning, behaviour and health for *all* children, not just those at risk. The study described quality kindergarten programs as a logical solution to many of the concerns about preserving community, accessibility of services, and the importance of early learning. Additionally, more effective interaction and collaboration among early childhood services, community services, and educational services were required to bridge early child development and education.

2.2.2. The Early Years Study 2

The Early Years Study 2 (McCain et al., 2007) was a report which built on the Early Years Study to promote its recommendations and make the neural and biological components of lifespan development accessible. This second report was a description of a neurophysiological approach to understanding human development–an approach which could lead to classroom interventions and outcomes other than behaviour-based models. The Early Years Study 2 explained the science behind creating a classroom environment where a child could explore his/her own individual ways of seeking calm, since reducing stress through high quality early childhood outcomes was found to be important to successful outcomes of mental health and learning (McCain et al., 2007). The Early Years 2 report summarized data from the National

Longitudinal Survey of Children and Youth (NLSCY) by Statistics Canada, defining vulnerable children as those who had a developmental difficulty like obesity, poor language skills, social problems, emotional regulation difficulties, attention problems, or learning difficulties. McCain et al. (2007) highlighted from the NLSCY data that about 25% of Canadian children under six were considered vulnerable and presumed to be likely to experience problems later in life. Data from the population-based Early Development Instrument (EDI; Janus & Offord, 2007) was matched with that of the NLSCY, with both finding that 25% of the population entering grade one was vulnerable.

2.2.3. Early Learning for Every Child Today (ELECT)

Early Learning for Every Child Today (ELECT; Best Start Expert Panel on Early Learning, 2007) focused on early childhood contexts. ELECT was an extensive review of early childhood curriculum and pedagogy in Canada and internationally, and on research findings and professional expertise. It described how young children develop and provided a guide for curriculum in Ontario's ECE settings. ELECT indicated that it was intended to complement the Ontario Day Nurseries Act (Day Nurseries Act, 1990), Early Years Centre guidelines (*Ontario Early Years Research Studies | Early Years Education Ontario Network*, n.d.), and *Kindergarten Program* (Ontario Ministry of Education, 2016b), thus bringing together different early childhood practitioners towards a common understanding and practice. It came to be recognized as a foundational document for early years' contexts as it provided a shared language and common understanding of early child development for early years' professionals (Ontario Ministry of Education, 2016b). The report reiterated that a quarter of Canadian children are vulnerable when they enter Grade 1. ELECT noted that additional efforts in relationship building, language use, and trust development were critical. The ELECT document was intended

to serve as a practical resource for Early Childhood Education (ECE) professionals to align the framework with the revised *Kindergarten Program* and other ECE programs.

2.2.4. Full-Day Kindergarten: Moving Ontario Forward

In 2008, the Elementary Teachers' Federation of Ontario (ETFO) followed up on the shared understanding described in ELECT and released *Full-Day Kindergarten: Moving Ontario Forward* (Elementary Teachers' Federation of Ontario, 2008) detailing the recommendations of ETFO for the upcoming implementation of full day kindergarten. The document would later inform the development of the *Kindergarten Program* (2016b) and illustrated that the Ontario Teachers' Federation of Ontario was on board with these advances in neuroscience and the need for a new framework and approach to early learning. A third Early Years Study summarized these advances in neuroscience to move Ontario's early childhood policies and practices forward.

2.2.5. The Early Years Study 3

The Early Years Study 3 (McCain et al., 2011) proposed solutions for financially efficient ways to support lifespan development and argued that if we synthesized findings from animal and human studies, birth cohort data, population data, observational studies, and clinical trials, we could see compelling evidence for a transdisciplinary approach to human development at a young age and expand on the science which supports the need for a new, neurophysiological approach. The Early Years Study 3 highlighted that in the several years to follow the second study, educational researchers continued to publish documentation which summarized research on the importance of a neurophysiological approach to child development (Government of Ontario, 2014; Ontario Ministry of Education, 2013). The Early Years Study 3 noted that upstream change in an evolving landscape of child development, and the impact it could have on

mental health could also be economically beneficial compared with the downstream approaches used to manage the increasing mental and physical health concerns. The Early Years Study indicated that universal foundational conditions essential to children thriving had common themes, including belonging (connectedness to others); well-being (physical and mental health and wellness, including self-regulation); engagement (involvement and focus), and expression (communication; Government of Ontario, 2014). These documents included work by foundational researchers including: Mary Ainsworth and John Bowlby (Bowlby, 1965), Jean Clinton (2014), Mary Gordon (Gordon, 2003), Michael Fullan (1997, 2010), Stuart Shanker (2012), Lev Vygotsky (1962), Loris Malaguzzi (Malaguzzi, 2016), and many other key child development experts, highlighting the importance of a developmental approach to preventing mental, physical, and behavioural lifespan challenges.

2.2.6. Early Years 4: Thriving Kids, Thriving Society

The fourth early years report (McCain, 2020) summarized much of this previous work, demonstrating that quality early childhood education is play-based and relationship-based, includes self-regulation, and ultimately results in positive long-term educational outcomes, mental health outcomes, and a positive impact on the financial, cultural, and sociological aspects of society.

Each of the documents cited in this section described how our knowledge of the early years has evolved to include neuroscience, developmental and social psychology, economics, medical research, and education to describe how teachers might create warm, supportive relationships for children who become happier, less anxious, and more motivated to learn. From *How Does Learning Happen*, and building on *ELECT*, and *The Ontario Early Years Policy Framework* came Ontario's *Kindergarten Program* (Ontario Ministry of Education, 2016b)

2.2.6. The Kindergarten Program

The *Kindergarten Program* (Ontario Ministry of Education, 2016b) was the culmination of extensive research on child development. Centering on a pedagogy where children are viewed as competent and capable, it mandated pedagogical approaches including responsive relationships, learning through exploration, play and inquiry, educators as co-learners, the environment as the third teacher, pedagogical documentation, and reflective practice and collaborative inquiry (Ontario Ministry of Education, 2016b). The *Kindergarten Program* identified the importance of the role that educators play in creating a safe, caring, inclusive and accepting learning environment to support cognitive, emotional, social, and physical development as well as resilience and well-being. Well-being is of critical importance to this pedagogy and is woven into all aspects of the *Kindergarten Program*, and in particular within the 'Self-Regulation and Well-Being' frame, which serves as one of the four frames of focus in the program.

The four frames align with the four foundational conditions needed for growth and thriving (belonging, well-being, expression, and engagement) as described in *How Does Learning Happen*? and are titled as follows:

1. Belonging and Contributing
2. Self-Regulation and Well-Being
3. Demonstrating Literacy and Mathematics Behaviours
4. Problem Solving and Innovating

The self-regulation frame includes children's thinking and feelings, recognition and respect for differences in others' thinking and feeling, emotion regulation, management of attention and distraction, engagement in learning, physical and mental well-being, self-

awareness, sense of self, ability to self-regulate, and the role of the environment in children's ability to be calm, focused, and alert to support their learning (Ontario Ministry of Education, 2016).

The *Kindergarten Program* (Ontario Ministry of Education, 2016b) discusses common misconceptions about self-regulation related to the wide array of definitional interpretations (i.e. that self-regulation is the same as compliance or self-control, and that an educator's role is to manage children's behaviour). The program aims to dispel these myths by providing neurophysiological evidence challenging these myths. The *Kindergarten Program* also discusses the importance of the classroom environment. Whereas a regimented classroom where children are all doing the same thing at the same time is viewed as counterproductive to self-regulation (Bronson, 2000), choice in materials and space, caring and kindness, collaborative problem solving, and reframing behaviour as stress-based, are all elements of an environment which is viewed as supporting self-regulation.

The authors defined self-regulation from a neurophysiological perspective based on this understanding of self-regulation as our response to stressors rather than behavioural self-control. They identified six critical elements of optimal self-regulation (Shanker, 2013) as:

- the ability to recognize when one is calm and alert
- the ability to recognize what is causing that stress
- the ability to recognize stressors both within and outside the classroom
- the desire to deal with those stressors
- the ability to develop strategies for dealing with those stressors
- the ability to recover efficiently and effectively from dealing with those stressors

The self-regulation ideas and related pedagogy were of sufficient importance that related assessment and evaluation were further discussed in a follow-up document, *Growing Success – The Kindergarten Addendum* (Ontario Ministry of Education, 2016a).

2.2.7. Growing Success – The Kindergarten Addendum

Growing Success – The Kindergarten Addendum (Ontario Ministry of Education, 2016a) indicated that educators were to use their professional judgement in conjunction with the *Kindergarten Program* (Ontario Ministry of Education, 2016b) to determine which of the expectations will be used to evaluate growth and learning. For the specific expectations of the Self-Regulation and Well-Being frame, self-regulation was defined in the *Kindergarten Program* (Ontario Ministry of Education, 2016) as:

> The ability to manage your own energy states, emotions, behaviours, and attention in ways that are socially acceptable and help achieve positive goals such as maintaining good relationships, learning, and maintaining well-being. Shanker draws on research to show how self-regulation lays the foundation for a child's long-term physical, psychological, behavioural, and educational well-being. (p. 8)

Growing Success outlined the importance of assessment—collecting evidence of learning through observations, conversations, and demonstrations of learning (Ontario Ministry of Education, 2016a). In doing so, educators were expected to provide evidence of growth through descriptive feedback to help students understand what they are learning and what might come next. Self-regulation, described as fundamental to learning in this document, was integrated into and assessed as part of Kindergarten learning outcomes (Ontario Ministry of Education, 2016a). In Ontario, report cards (*Kindergarten Communication of Learning: Initial Observations)* are issued at the end of the first reporting period between October 20 and November 20 to provide

parents with an overview of initial observations of the evidence of their child's growth in relation to the overall *Kindergarten Program* (Ontario Ministry of Education, 2016b) expectations. The Kindergarten Communication of Learning is then issued both at the end of the second reporting period (January 20 – February 20) and third reporting period (end of June). Educators are expected to focus on what children have learned and how they have grown. The templates for the Kindergarten Communication of Learning (both Initial observations and other reporting periods) can be found in Appendix A.

In summary, based on extensive reports describing consensus from leading experts in child development, Ontario's Ministry of Education (2016b) has adopted a developmental definition of self-regulation in the *Kindergarten Program* as the human process of responding to individual stressors in order to effectively manage energy and tension. In particular, the Ontario Ministry of Education has underpinned its more recent documents with Shanker's (2016) comprehensive, science-based framework of self-regulation. Philosopher Dr. Stuart Shanker has drawn on philosophical foundations (Weinert, 2014; Wittgenstein et al., 2001), child development (Greenspan, 2007; Greenspan & Shanker, 2004), evolutionary psychology and neuroscience (Maclean, 1985; Montag & Panksepp, 2017; Porges, 2011; Thayer et al., 2009), neurophysiology (Porges, 2013), systems theory of human development (Fogel et al., 2008), attachment theory (Schore, 2012b, 2012a), cognition, learning and educational psychology (Bruner, 2006) and finally, behaviour, communication and flexibility (Greene, 2007), among others, to develop a framework for effectively targeting self-regulation to change the developmental trajectories of children across their lifespans.

2.3. The Shanker Self-Reg © Framework: A developmental approach

Shanker's Self-Reg framework (Shanker, 2016) not only accounts for and contextualizes the discrepancies among self-regulation, self-control, and other definitions, but also provides a process-based framework (a five-step, non-linear process) across five different domains of stressors through which parents, educators, and individuals can effectively support mental and physical well-being through self-regulation. Figure 2 illustrates the components of the model, which includes five practices (Reframe, Recognize, Reduce, Reflect, Respond) in each domain (biological, emotion, cognitive, social, prosocial) where one can enter the process at any given point.

Figure 2

The Shanker Self-Reg Framework

Shanker (2013, 2016) developed the Self-Reg framework to bring together many aspects of developmental science. Shanker Self-Reg reframes much of the existing research on child development by looking at challenges to human development in the areas of behaviour, mental and physical health, evolutionary psychology, neuropsychology, biophysiology, and philosophy.

Self-regulation is thus not defined as the ability to control one's own behaviour and thoughts, but as *the body's ability to respond to and recover from stressors*, which humans have evolved to do through connecting with one another in various ways. When we shift our lens from a behavioural to a neurophysiological self-reg perspective, our approaches change, becoming more proactive, and focus on stress management rather than behaviour control (a shift which, in most cases, prevents unwanted behaviours from occurring). Shanker argued that we also develop the potential to go beyond our current understanding and intervention. For example, Schore (2012) described how attachment theory changed how we looked at the importance of relationships in child emotional development and their effects on long-term outcomes.

Attachment theory suggested that long term outcomes are not a product of managing behaviours and teaching skills, but of relationships. Stanley Greenspan, one of Shanker's mentors, reframed child development and early intervention, focusing on the importance of self-regulation as a prerequisite for later child development, including self-regulated learning and self-control (Greenspan, 2007; Greenspan & Shanker, 2004; Greenspan & Shanker, 2007). Other child psychologists, such as Ross Greene (2007) reframed behaviour, communication, and flexible thinking in terms beyond behaviour control. They began looking at *why* behaviour was happening, going beyond how to change it via prompts and consequences. The approach was evolving away from radical behaviourism and beyond cognitive approaches as well, into a neurophysiological approach which considers these aspects of evolutionary psychology and neuroscience. Many others have followed suit. For example, David Tranter's *Third Path* (Tranter et al., 2018) used Shanker's framework to define self-regulation within his relationship-based approach to social emotional learning. Mona Delahooke's *Social and Emotional Development in Early Intervention* and *Beyond Behaviours: Using Brain Science and Compassion to Understand*

and Solve Children's Behavioural Challenges (Delahooke, 2019) drew on such sources as Stephen Porges, Stanley Greenspan, Ross Greene, Stuart Shanker, and other developmentalists to understand and explain behaviour as an unconscious stress response arising from problems of self-regulation (a neurophysiological framework).

Because many of these contemporary frameworks drew on Shanker's Self-Reg framework, I too will draw from Shanker's work to adopt the definition and framework of self-regulation used in the Ontario *Kindergarten Program* (Ontario Ministry of Education, 2016b). For the purposes of this dissertation, self-regulation is defined by Shanker's Self-Reg framework and is adopted by the Ontario Ministry of Education. Self-regulation is defined as the body's ability to respond to and recover from stressors, including the energy expense of responding to stressors across five domains (biological, emotion, cognitive, social, and prosocial) through a process of reframing behaviour, recognizing stressors, reducing stressors, reflecting upon one's individual process of stress responding, and recovering from the energy expended in managing stressors (Shanker, 2016).

2.3.1 Five Domains of Self-Regulation

Shanker (2014) theorized that humans each experience individualized stressors which overlap and interact among five domains as delineated below, with the primary goal of achieving optimal self-regulation—a state of being calmly focused and alert.

2.3.1.1. Biological Domain. The biological domain includes sensory-based over-sensitivity (avoidance) and under-sensitivity (sensory seeking), physical illness, and other biological aspects of the body like hydration and hunger. It includes the concept of interoception, or one's ability to feel or perceive feeling in their internal organs and skin reflecting their state or condition (e.g., pain, temperature, itch, hunger, breath, tension, sleepiness; Mahler, 2017).

Stressors in this domain might also include sensory processing differences functioning as stressors [visual, auditory, tactile, gustatory, olfactory, proprioceptive (joints and muscles), vestibular (balance), and interoceptive (internal organs)]. Interoception is a lesser-known sense that helps a person understand and feel what is going on inside their body. Children who struggle with the interoceptive sense may have trouble knowing when they feel hungry, thirsty, hot, cold or uncomfortable. Having trouble with this sense can make self-regulation a challenge.

2.3.1.2. Emotion Domain. The emotion domain includes understanding one's strong emotions along a continuum from positive to negative, where either consumes or generates energy (Shanker, 2012, 2016). Children who are optimally regulated can better modulate these emotions, recover from them positively, and experiment independently to discover the impact of their own and others' emotional states (positively and negatively). Our emotional functioning is a precursor to our cognitive functioning, developing very early as children learn to differentiate and communicate their emotions through awareness and self-reflection (Greenspan, 2007; Greenspan et al, 1998). As early as 18-24 months of age, children develop the ability to communicate through purposeful and symbolic communication rather than just unfocused behaviour, and to modulate those emotions based on how their caregivers respond to help them regulate (Greenspan et al., 1998). Stressors in the emotion domain include the experience of big emotions such as anger, frustration, or excitement, or recovering from embarrassment or disappointment (Shanker, 2016). The emotion domain cannot be underestimated since emotional regulation is connected to the other domains. For example, our emotions impact our thoughts (cognitions), and our thoughts can impact our emotions, the basis of Cognitive Behaviour Therapy (Scarpa & Reyes, 2011).

2.3.1.3. Cognitive Domain. The cognitive domain refers to mental processes involved in learning such as memory, perception, problem solving, and sustaining/switching attention (Shanker, 2016). Common stressors in this domain include attentiveness and the ability to ignore distractions, combining and sequencing ideas, tolerating frustration, learning from mistakes, and seeing cause and effect patterns; essentially, many of the aspects involved in executive functioning (Shanker, 2016).

2.3.1.4. Social Domain. The social domain includes an individual's understanding, assessment, and individualized responses to social cues in the environment and their effects on the nervous system. Regulation in the social domain refers to the processing of and responding to relevant social cues (Shanker, 2012). Stressors in the social domain may include being bullied, confusing social situations, hypersensitivity to social signals, peer pressure, or public speaking (Shanker and Hopkinds, 2019). Key attributes of optimal regulation include the child's ability to understand their own emotions and intentions as well as those of others, respond to them appropriately, monitor their communication and effects, demonstrate good humour without ridiculing, and recover from and repair communication breakdowns (Shanker, 2012).

2.3.1.5. Prosocial Domain. The prosocial domain involves positive social behaviours which promote social acceptance and empathy, and our tendency to co-regulate each other's affective states with our own. Much of Greenspan's (Greenspan et al., 1998) comprehensive and foundational work in affective child development is grounded in the fact that co-regulation is the very foundation of self-regulation. Infants first learn to self-regulate by being regulated by their parents in co-regulated, reciprocal interactions. Later, Sossin and Charone-Sossin (2007) suggest, self- and other- monitoring develops into the ability to transition among inner states where one is better able to predict the behaviours of others over time. Examples of stressors in the prosocial

domain include guilt, being late, dealing with others' strong emotions or feeling their stress, or being influenced by stereotypes (Shanker and Hopkins, 2019). The challenge in the prosocial domain lies in its lack of clear definition and measurability. Since the prosocial domain includes empathy, understanding the perspective of others, and being optimally regulated oneself, it can be one of the more complex domains to achieve balance within, yet this is an area of growing importance.

2.3.2 A Framework, Not a Program

While educators often seek a neatly packaged, manualized intervention, it is important to note that Shanker Self-Reg™ (Shanker, 2016) is a philosophical framework, not a step-by-step program. Utilizing a framework helps us identify why we do what we do. In this example, a framework, as opposed to a program, allows us to reframe child development philosophically. Shanker Self-Reg (Shanker, 2016) is not about a scripted intervention (what to do) but instead involves a shift in thinking which, if utilized, leads to different practices of well-being (how we respond to stressors and how we relate to others). Shanker's Self-Reg (2016) framework differs from commercial, pre-packaged programs in that it describes a way of thinking that may impact those around us—it does not prescribe what to do. Many programs include structured lesson plans, handouts, and clear instructions on what to do (and when) for an entire classroom of students in a pre-planned group lesson, but Shanker Self-Reg is not about *what* to do. Shanker Self-Reg is not a program designed specifically for teachers—it is a way of bringing together advances in neuroscience to understand the influences on human mental and physical health, well-being, and behaviour. While Shanker does not provide a program within his philosophical framework, he nonetheless outlines a process that individuals use to maintain balance in the nervous system and feel good. Shanker (2016) describes the process, outlined in the next section,

as a series of five practices that individuals embody, not in terms of *things we do* to support our well-being, but rather *how we think* about well-being.

2.3.3. Five Practices

Shanker's process involves five practices, or steps, that are simultaneous rather than linear, which many would argue makes sense, given that human development is not a linear process either. The five practices are co-occurring and form an iterative developmental process of reframing, recognizing stressors, reducing stressors, reflecting on one's individual experience with stressors, and responding to stressors in order to recover (Shanker, 2016). These practices are specific to individuals and each person (adult or child) can use these practices to enhance their own well-being as part of their own self-regulatory functioning.

In the context of education, Shanker suggests that teachers can use these practices to maintain their own sense of self-regulation and balance of the brain/body. In turn, as calm and regulated adults, he suggests that they then have the capacity to co-regulate (share their calm) through their interactions with their students, support students in understanding this process through experiential learning (not cognitively based group lessons), so they in time can become more competent and automatic in this process as well. Students learn this process not through cognitively reading or hearing about the steps, but through guiding relationships with trusted adults who facilitate feelings of safety, calm, and connection or as Clinton (2020) states, "feeling felt". When humans feel safe, calm and connected, Shanker contends—when they feel *felt*—they flourish and typically develop self-regulation themselves as a natural part of the human development process of recognizing and responding to one's individual stressors (Grolnick, 2009). Self-regulation is not about what one does – it is about nurturing the relationships and environment that facilitate a student's ability to develop these capacities independently.

2.3.3.1. Reframing. Reframing refers to looking at something in a new way to understand the meaning of behaviours differently, such as reframing misbehaviour as stress behaviour (Shanker, 2016). In the kindergarten context, misbehaviour is connected to purposeful actions (intentionality, choice, etc.) so one tends to respond by using consequences specific to behaviours. However, we can reframe behaviours, thinking about them not as misbehaviour but as stress behaviour. Shanker (2017) contends that this helps us to understand that the behaviour is not intentional and planned, but reactive, caused by unconscious processes prior to conscious choice as an adaptive response to a stressful environment. When we reframe in this way, our automatic response shifts to empathy, compassion, and self-regulation.

2.3.3.2. Recognizing. Shanker states that individuals also need to work on recognizing, or identifying the stressors, both overt and hidden, across the five domains. Hidden stressors might include biological stressors such as bright lights, visual stimulation, or smells; emotion-based stressors like anticipation or sadness; cognitive stressors such as using working memory during a math activity; social stressors such as meeting new people; and prosocial stressors such as empathy. Identifying stressors is thus a highly individual process because what is stressful for one person may be calming for another, which reiterates why self-regulation is an individual process that cannot be taught as a whole group activity through a pre-packaged program.

2.3.3.3. Reducing. Once individuals are more aware of the stressors impacting them, they can *reduce* them to the best of their ability or eliminate them completely. Certainly, one cannot always completely eliminate stressors, but recognition of them allows an individual to minimize the impact on one's own functioning. For example, an educator might choose to remove some materials from walls to avoid overstimulation, add tennis balls to chair legs to reduce sound in the classroom, replace harsh fluorescent lighting with natural light or incandescent lamps,

provide visual instructions to reduce cognitive load, or scaffold new social experiences for a student.

2.3.3.4. Reflecting. Reflection is a critical aspect of the self-regulation process. It involves awareness of one's own inner state to identify where one's individual stressors come from, not just the simple fact that one IS stressed. Again, this needs to be an individualized process that happens in reflective moments throughout the day and not at a scheduled time during a particular class lesson. Through Shanker Self-Reg, one can learn to be more reflective about their own experience and acknowledge that their experience is unique from those around them (Shanker, 2016). Reflection encourages individuals to think about their own stressors and to discover what makes them feel calm.

2.3.3.5. Responding. Lastly, one learns to *respond* to the stressors in one's awareness. A person learns strategies in the moment to replenish their energy. People respond to stressors as they are affected by them and select strategies that might work in that moment, but not in others. When one is better able to recognize their own individual stressors and reflect on how stimuli in the environment stress or relax them, they are better able to respond and restore the energy required to continue in a calm and alert state.

This process mirrors how child development occurs, rather than through a series of parenting steps taught once per week. Packaged programs can provide easy to follow, step-by-step lessons on identifying emotions and even common stress reduction strategies, but Shanker argues that this does not individualize the dynamic systems process. The fact that everyone might not necessarily respond to commonly taught strategies (e.g., yoga) in the same way contributes to some of the challenges inherent in Shanker Self-Reg©.

2.3.4 Challenges of Shanker Self-Reg ©

Shanker Self-Reg (2016) is a theoretical framework. There are steps indicated, but they are non-linear practices, and are not spelled out in a curriculum nor program guide, making them potentially difficult to implement consistently. Shanker Self-Reg is certainly not as simple as teaching a specific program through planned and pre-written lessons. It is founded on a philosophical shift in thinking which can be a challenge, given that some are resistant to change (Fullan, 1997). Educators may be drawn toward quick and easily implemented strategies and may not have much additional time for the in-depth learning required for such a philosophical shift. Nichols (2010) found that there is a difference between implementing a program and understanding the theory underlying a program which can impact how the program is implemented. Shanker Self-Reg is about understanding the underlying theory which is different from following a set of behaviourally based steps.

While potentially very valuable, the Foundations learning process (the coursework for learning Shanker Self-Reg) has not yet been empirically studied in terms of its effectiveness for educator practices. There is limited empirical support for Shanker Self-Reg (Shanker, 2016) at this time. A theory is more difficult to empirically support than a behaviourally-based program is, and a theoretical framework needs to be examined in a different way than a program would be. Frameworks are more challenging to validate empirically because they are a way of thinking rather than a prescribed set of behaviourally-based steps. Shanker Self-Reg describes a way of thinking rather than a step-by-step intervention and cannot be replicated since it is by its very nature, designed to be individualistic. Specific self-regulation outcomes are difficult to measure, since a readily available tool does not yet exist to measure self-regulation using this definition. There is increasing research in neurophysiological measures such as Heart Rate Variability

(HRV) and vagal tone, as well as measures of the nervous system's resilience to stressors (Patriquin et al., 2013; Porges, 2015; Porges & Furman, 2011), but these are lab-based and outside the context of the classroom and outside the scope of this dissertation. As a result, it may be difficult for school administrators to invest in training and resources that lead to philosophical shifts without presenting evidence-based strategies for direct classroom facilitation and reported child outcomes.

In contrast, there was no research found that challenges Shanker's framework (5 domains and 5 stressors) about self-regulation. In the meantime, qualitative research examining the self-regulation practices being employed by teachers and the themes emerging may provide insight into how educators understand, facilitate and assess self-regulation in young learners. More research in this area is needed to empirically examine the impact of this framework on classroom practice. More research in this area is needed to empirically examine the impact of the Shanker framework on teacher facilitation. Educator facilitation practices one of the foci of the current study, examining how educators facilitate self-regulation in their classrooms and whether Shanker Self-Reg and other aligned resources impact their practices. Future research possibilities for examining educator facilitation approaches are discussed in greater detail in Chapter 6.

Furthermore, the idea that Shanker Self-Reg is a framework, and thus not intended to provide a step-by-step, manualized list of lesson plans for educators to follow may make it less appealing to educators. Manualized programs and pre-written lesson plans designed to teach specific knowledge and terminology might be preferred by educators who have so much stress in their roles already. Educators may perceive that changing *how* one thinks requires greater effort than implementing a readily available, pre-packaged program, an idea supported by Fullan

(1997) who pointed out that educators may be resistant to change. There are several types of ready-made programs purported to target self-regulation, and it is important to critically examine their content and objectives to determine how they align with some of the underlying theory described in the previous section. Several of these programs are summarized in Section 2.4.

2.4 Programs and Curricula Purported to Target Self-Regulation

Given the increased attention to self-regulation in education, there are some programs which have emerged with the goal of helping educators to 'teach' self-regulation skills to their students through specific lessons and classroom activities. They each demonstrate the use of different definitions of self-regulation. Initially, the programs I chose to summarize below were those that were mentioned in the literature I reviewed (section 2.5), or that came up in preliminary discussions with educators and experts in the field. After completing data collection, several more programs emerged as ones that were utilized by the participants' school board (namely, *Al's Pals, Daily Five*, and *Leader in Me*). Some of these programs have limited support, such as Zones of Regulation (Kuypers, 2011), Mind Up (The Hawn Foundation, 2011), and Al's Pals (Wingspan, 2004), as described in the following sections. However, the evidence-based research is premised on behaviour outcomes in students and not on the educator's understanding or effective implementation of the program. There is a difference between an educator understanding the theory of self-regulation and then implementing the program.

The *Alert Program* (Williams & Shellenberger, 1996) is a systematic experiential learning program which involves the promotion of regulation of one's own arousal states and use of sensorimotor strategies. These sensorimotor strategies are used to manage alertness, to learn, to interact, and to self-monitor by adding or limiting movement, sounds, visuals, and other sensory inputs as needed and discussing and reflecting with children about how they affect the

running of their metaphorical engine (too fast, too slow, or just right). *The Alert Program* outlines for parents, educators, and/or therapists the underlying framework to regulation including occupational therapy, sensory integration, arousal theory, protective responses of the autonomic nervous system, and behavioural/proprioceptive inhibition. Evolving over three stages, the intervention involves supporting a child in understanding his/her arousal using an analogy to a running engine's speed (too fast, too slow, or just right), experimenting with methods to change the engine speed, and then regulating them to remain in an optimal arousal level. While well-grounded in physiological arousal theory, its evidence base is limited. Two papers were found in the literature, but both appear to be the same study with varying amounts of detail included, published in two separate journals (Mac Cobb, Fitzgerald, & Lanigan-O'Keeffe, 2014; Mac Cobb, Fitzgerald, Lanigan-O'Keeffe, et al., 2014). The researchers adapted and trialed the program with 84 socially disadvantaged youth (age 12-13) across a 40 minute per week for 5-week trial, and a subsequent 40 minute per week for 8-week trial. Qualitative analysis showed that the Alert program was mostly well-accepted by teachers as a good program, but also that more teacher training would be required to maximize understanding and consistent and sustained application of the program. A third small study examined the efficacy of *the Alert Program* for classroom use with seven children described as having emotional disturbance. Results indicated small improvements in average Sensory Profile scores and improved scores for only two of the children (as compared to four of the control group participants) in the Devereux Behavior Rating Scale for inappropriate behaviours. Teacher reports on the Teacher's Perception of Student's Efficacy in Self-Regulation (SESR-C; a tool about which I was unable to find any further research) showed that teachers reported improved scores for the intervention group post-

test. Because of the very small sample size and sample specific to children with emotional disturbance, these results lack statistical power and are thus preliminary.

The *ALERT program* looks at only whether a child needs to up-regulate (engine is running too slow) or down-regulate (engine is running too fast). It specifies the level of regulation which is desired (just right) rather than focusing simply on how a child feels, and it works toward rewarding a child for being at the right level. The program is not designed to help a child understand what his/her stressors are, nor does it encourage the child to reflect or respond to the stressors in order to restore energy. While it may provide some tools to help children discuss how they are feeling from a cognitive perspective, it differs from the dynamic system described in Shanker Self-Reg (Shanker, 2016) because it involves talking about or labelling feelings (cognitively) rather than experiencing and responding to them and then reflecting on the stressors across the five domains that may have influenced energy and tension levels. By taking a predominantly cognitive approach, one may assume that the child has access to their prefrontal state and can process, which many cannot when under too much stress (Thayer et al., 2009). This program shows promise as a supportive tool in the self-regulation process but does not appear to be robust enough to encompass the full framework described above (Shanker, 2016).

2.4.2. Zones of Regulation

Another well-known program designed to target self-regulation is the *Zones of Regulation* (Kuypers, 2011) which is a structured intervention intended to be delivered by elementary and secondary classroom teachers through 18 short, weekly, progressive lessons and follow up activities. The program combines strategies such as affect awareness, affect identification, affect classification, tools for changing affect, problem solving, and theory of mind. While anecdotally popular with educators and school boards, there is almost no

systematic, empirical study of its effectiveness. One study (Hoffman, 2018) found inconsistent results in the effects of the program on conflicts among third graders, and a focus group of four of these students showed that they may be better able to identify and categorize their feelings as a result of participating in the program. These results were limited as they were based on a small sample of four children's responses. A second study (Munro, 2017) was an action research study where an educator did a thematic analysis of teacher and researcher journal comments recorded after *Zones* lessons were conducted. Themes of self-awareness, focus, empathy, acceptance, influence, and empowerment were found, and the researcher made a claim that the program was valuable for teaching self-regulation skills.

There are challenges inherent in the *Zones of Regulation* program when it is evaluated in terms of the definition of self-regulation as the nervous system's means of responding to stress and managing energy and tension. The program potentially impedes the reflection process which is vital to frameworks like Shanker Self-Reg (Shanker, 2016) by focusing on which zone a child *should* be in and rewarding him/her for getting there. The *Zones of Regulation* program is less about helping a child to self-reflect on how they got there and what worked to make them feel better (self-regulation) than it is about getting to a place where the child could become compliant (self-control). Again, there may be aspects of the program which can support a dynamic self-regulation process, but there are limitations in terms of its evidence base and more importantly, its alignment with the Ontario Ministry of Education self-regulation framework included in the Kindergarten curriculum document.

2.4.3. Mind Up

Mind Up (The Hawn Foundation, 2011) is a manualized social-emotional learning curriculum consisting of a series of 15 sequenced classroom lessons which take 10 – 30 minutes

per day with the content addressing attention focus, sharpening senses, attitude, and mindful action. It teaches children to engage in deep breathing to become calm. There are manuals for three age groups; kindergarten to grade two, grades three to five, and grades six to eight. The lessons include repetition of core practices (breathing and attentive listening) and make mindful attention the foundation for daily interactions with others. Teachers are encouraged to repeat these lessons for a few moments per day throughout the school year. Mind Up is intended to help children reflect rather than respond. Research on the program has focused on social emotional competencies, with outcomes measures including teacher-rated school behaviour and general self-concept (Schonert-Reichl & Lawlor, 2010), optimism, emotional control and empathy, prosocial goals and mindful attention (Schonert-Reichl et al, 2015). Schonert-Reichl et al (2015) found that children who participated in the program showed improvements in cognitive control, empathy, emotional control, and peer acceptance. This series of studies by the same group of researchers showed some positive findings; however, they were focused on measures that were related to but not the same as the definition of self-regulation adopted in this study. The focus on emotional control, goals, and control of attention is more related to self-control. Further, the program itself is geared to prescribed lessons occurring just a few minutes per day, and not the facilitation of a process occurring throughout the day which supports child development through mindfulness of stressors and individualized responses across integrated domains.

2.4.4. Well Aware

Well Aware is a program focused on promoting well-being through literacy activities for children up to grade twelve (Carney & Parr, 2014). It focuses on developing well-being (coping with adversity, physically well and active, safety, inclusion and social support, competence and connectedness with others) through social emotional learning and how these constructs impact

academic, behavioural, and emotional outcomes (Carney & Parr, 2014). Part of Well Aware's recommended process includes targeting self-regulation as defined by Shanker (2010) – namely, the ability to manage one's energy states, emotions, behaviours, and attention. However, Well Aware focuses on the social emotional learning aspect of self-regulation whereby children recognize their emotions (cognitively) and regulate their emotions (behaviourally), in an independent and individualized manner (Carney & Parr, 2014). The program is designed to be incorporated into the existing literacy curriculum and includes four texts per grade (from grades 4-8) focusing on issues related to mental well-being followed by a series of questions and worksheets as discussion starters incorporated into the literacy-based lesson plans. The program includes structure which may help facilitate self-regulated learning during the four lessons per year. It includes the components of centering (preparation for learning such as deep breathing), contemplating (thinking about the importance of the learning content), connecting (considering existing knowledge and what is needed), confirming (considering application of learned knowledge), and creating (considering novel applications of learned knowledge). Finally, it includes celebration, which is intended to promote confidence, efficacy, self-regulation, competence, and self-concept. Since it is a new program, there is no empirical support available yet. Furthermore, the program is focused on self-regulated learning as opposed to self-regulation specifically. While it may provide some support for the process of self-regulation, it is not designed to target self-regulation specifically, so does not embrace the more holistic neurophysiological approach of self-regulation (Burman, 2015). Furthermore, it is limited to four lessons per year which look only at the cognitive aspect of naming emotions in literature, and not a holistic, all-day process of guiding children through experiencing and responding to their stressors across five domains.

2.4.5. Third Path

Another new resource for educators is entitled Third Path (Tranter et al., 2018). The author, Dr. David Tranter, has written a Research Monograph for Ontario's *What Works* Series which outlines a framework (definition of and approach to) self-regulation that is very much aligned with Shanker Self-Reg (Shanker, 2016) and the science that underlies it (Tranter & Kerr, 2016) for students from junior kindergarten to grade twelve. It cites Burman et al (2015) in referencing the 447 meanings inherent in self-regulation research, and the fact that educators and experts both confound self-regulation with self-control. Additionally, this monograph outlines the importance of having a valid understanding of self-regulation which is critical to teaching self-regulation to students. It reviews how self-regulation is different from self-control and executive function, yet also demonstrates how they are related. The Third Path discusses self-regulation as an individualized process of responding to stress and managing one's state of arousal, through relationships, calm teachers, aspects of the classroom environment, self-awareness and reflection, and time. The book proposes that once educators can understand self-regulation in this way, they will be better equipped to select and utilize valid and appropriate strategies to support their students more effectively (Tranter & Kerr, 2016). It bears much resemblance to the framework proposed by Dr. Shanker and may be a reworking of his work. Thus far there has been no empirical research published on the efficacy of the program/framework, though its ideas bear promise in being closely related to the Ministry-adopted neurophysiological definition of self-regulation.

2.4.6. Banking Time

Banking Time (Hatfield & Williford, 2016) is an example of an intervention designed to increase the time teachers spend with elementary school-aged children in child-led activities. It is

designed to change how teachers interact with students by observing their behaviours and affect, narrating their actions in child-led activities, labeling children's feelings to understand the child's perspective, and developing important aspects of the teacher-child relationship. It has limited empirical support thus far. Hatfield and Williford themselves (2016) found this intervention to result in a decline in children's cortisol levels throughout the day, which is promising, but further independent research is warranted to examine its effectiveness and understand its purpose.

2.4.7. Al's Pals

Al's Pals was not originally included in the review of available programs since it did not emerge from a search of the literature about self-regulation programs. However, I discovered that this is the program in which the participants of this study had been trained for instead, across the school board, so it is retroactively described here because it is a highly cited program in the results of this study.

Al's Pals is an early childhood (ages 3-8) curriculum and teacher training package designed to teach children skills to deal with day to day life, relate to other people, and meet their own needs in socially acceptable ways (Wingspan, 2004). The goal is to develop resilience in children, explaining that common characteristics of resilient children include social competence, problem-solving skills, autonomy (including self-control, self-discipline, and independence), and a sense of future and purpose. The program includes 46 fifteen-minute lessons focused on reaching pro-social life skills including identifying and understanding feelings, expressing and responding to feelings, respecting other, and making healthy choices. The training for educators encourages them to guide children in developing resilience through initial lessons and later throughout other aspects of their day.

Research on the program's efficacy was conducted by partners of the program developers (Dubas et al., 1998; Lynch, 1996, 1997) revealing increased teacher understanding of substance abuse issues and prevention. Another study by partners of the program's developers cited that children who participated in the *Al's Pals* program showed increased positive social behaviours [self-control, social problem solving (sharing and using words) and identification and appropriate expression of emotion], and less aggression and antisocial behaviour (hitting, kicking, name-calling, bullying, and destroying others' belongings (Lynch et al., 2004).

Although research pertaining to this program occurred over two decades ago and may be biased based on the fact that supporting research is done by partners of the program's developers, this research does point to some beneficial outcomes based on prosocial behaviours and decreased aggression. It is a socio-emotional and problem-solving program that has achieved national recognition (Wingspan, 2004). For the purposes of the current study, however, it is noted that the program specifies a focus on teaching socially appropriate behaviours and self-control as a means to developing resiliency, rather than focusing specifically on self-regulation.

2.4.8. Daily Five

Daily Five (Boushey & Moser, 2014) is a highly structured program for teaching and learning independence in literacy in elementary classrooms. Daily Five was retroactively included here in the literature review because it was mentioned by participants as a resource that contributed to student self-regulation. The program creates a 5-step structure designed to minimize busywork, increase independence, and accelerate learning through demonstration, shared demonstration, guided practice, and then independent practice, with the intent of transferring responsibility from the teacher to the student. It involves teaching steps such as setting a purpose, recording desired behaviours based on rules and expectations on a data chart,

modelling most- and least-desired behaviours, practicing signals to bring student attention back to the group, and checking in about how it went. The program was designed to incorporate the positive effects of choice on motivation (Glasser, 1999) and research supports the program as effective in developing positive literacy outcomes (Buchan, 2017). While the program may include concepts of scaffolding, developing independence, and self-determination that may be part of self-regulation, the program is not a self-regulation program, but rather a literacy program aimed to target a different frame of the *Kindergarten Program* altogether.

2.4.9. Leader in Me

Leader in Me (Covey, n.d.) is also a program that was included here because of its appearance in the data collection phase of this dissertation work. Leader in Me is a social learning program for elementary classrooms designed to empower students in leadership and life skills through improving executive function skills in order to impact the things they do and the results they achieve (Covey, n.d.). The program is based on the *7 Habits of Highly Successful People* (Covey, 2004), with the reported results of increasing student leadership behaviours; decreasing behavioural incidents, discipline incidences, and discipline issues; and improving independent academic learning (Covey, n.d.) through discussing, modeling, and reinforcing the 7 Habits. (Franklin Covey Education, n.d.). Because it does not specifically target self-regulation, I will not discuss it in detail here other than providing this overview because the program is mentioned in my results section since an educator made a connection between this program and self-regulation.

2.4.10. Do Self-Regulation "Programs" Work?

To examine the effectiveness of programs purported to target self-regulation, Pandey et al (2018) completed a meta-analysis of the research looking at self-regulation interventions. The

researchers concluded that self-regulation programs (from 1977-2017) are in fact effective, citing outcome measures including academic achievement, social skills, mental well-being, behaviour problems, conduct disorders, school suspensions and substance abuse. While they were deemed 'effective', one critical question remains: *What are they effective at doing?* The studies included in the meta-analysis may have reported effectiveness in self-monitoring, self-control, and/or even behavioural compliance but not in the neurophysiological definition of self-regulation as described by Shanker (2016). Increasing self-monitoring, self-control, and compliance may actually increase stress and lead to the student 'shutting down' due to increased difficulties with mental well-being, and resultant behaviour, even if students appear to be compliant (Shanker, 2016). He references Porges' research (2013) that sometimes compliance or apparent self-control may even be a sign of dissociation, a reactive state even more severe and damaging to mental well-being than a fight or flight response.

While pre-packaged programs may seem like a quick solution for educators, the self-regulation process is much more dynamic and complex, and these curricula lack the individualization and in-the-moment embodiment of the five-practice process of self-regulation that may be required to truly become self-regulated as defined by Shanker (2010). These programs strive to teach some of the elements of self-regulation but are likely too structured in format to be able to support children in their own individual and neurophysiological processes of self-regulation as outlined in the *Kindergarten Program* (Ontario Ministry of Education, 2016b). Furthermore, Nichols (2010) found that teachers who were implementing practices aligned with specific programs may not understand what they are actually being asked to do and may not realize that some of their practices are not, aligned with the program's mandate. What teachers say they are doing does not necessarily match what they are doing (Nichols, 2010). Thus, even if

educators are using these specific programs, their possible lack of understanding of the theoretical underpinnings of self-regulation may impact how they implement the programs. Furthermore, programs are designed to help support student self-regulation as opposed to educator self-regulation. In contrast, Shanker's self-regulation framework begins with teaching self-regulation first, and then considers how the self-regulated teacher can co-regulate their students. There may well be some beneficial pieces to each of the above programs, but if educators do not understand the science that underlies self-regulation, their facilitation practices may not align with the recommendations set forth in the *Kindergarten Program*'s *Self-Regulation and Well Being* frame.

It is important to know which frameworks do not work to effectively facilitate self-regulation in the classroom, but it is also important to examine which ones do. Is there other research beyond these programs that examines self-regulation specifically in Kindergarten environments that might be aligned with Shanker's neurophysiological definition of self-regulation? Is there any research that represents self-regulation as a process – a dynamic, neurologically-based system of recognizing and responding to stressors, and what might that look like? Are any of these programs studied in the literature? Whereas Burman (2015) used statistical analysis to determine the different categories of definitions of self-regulation, the next section presents the Kindergarten context to understand which definitions of self-regulation are embedded in the Kindergarten research.

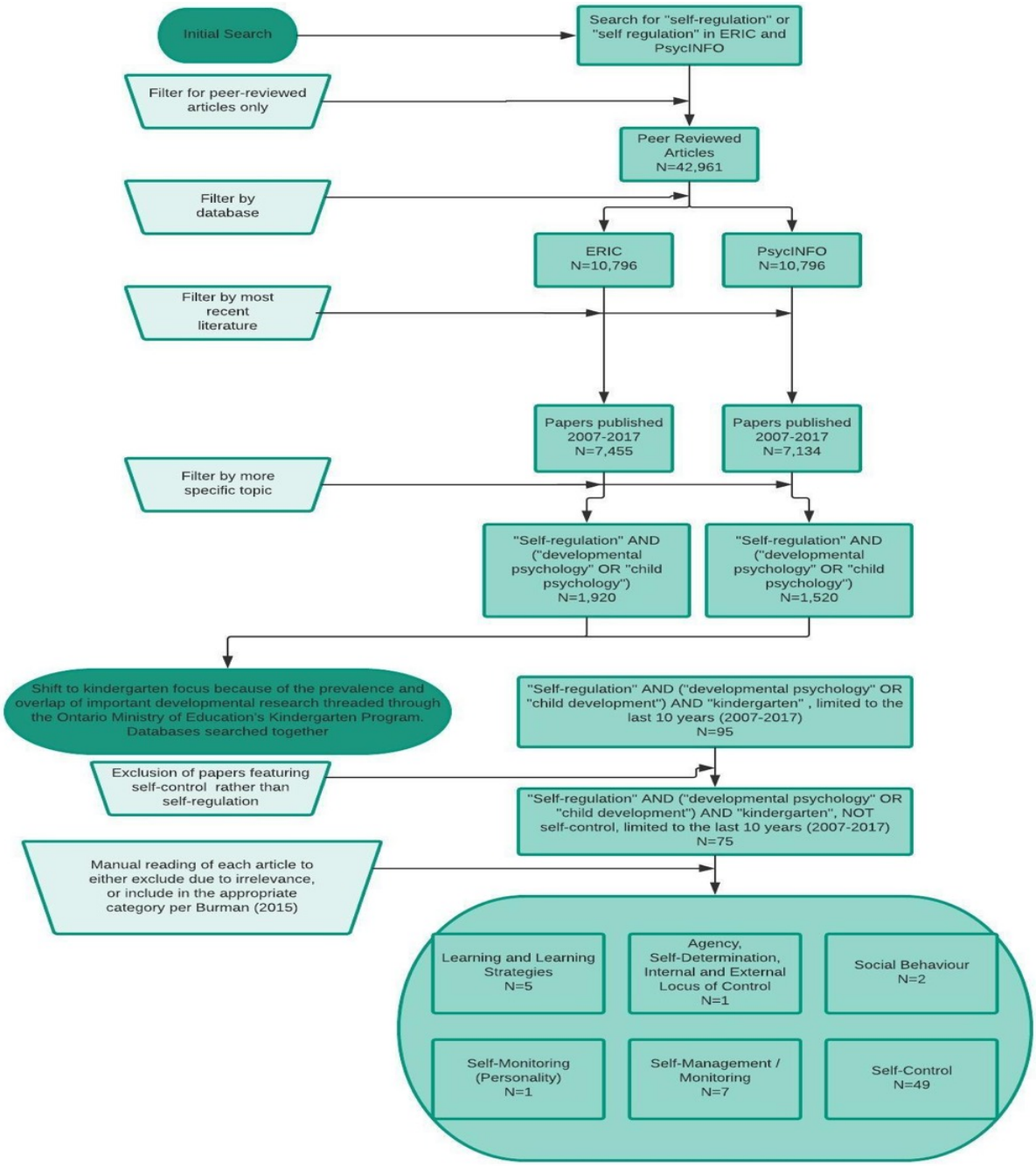
2.5 Categories of Self-Regulation Represented in the Kindergarten Research

Whereas Burman's (2015) work summarized research on self-regulation overall, I wanted to focus on the research specific to kindergarten education to see which definitions and frameworks were being used in research on self-regulation in the early years. Of the six

categories of definitions Burman found, I wondered which categories were predominantly used in kindergarten research. I searched both the ERIC education database and PSYCInfo psychology databases using the search term “self-regulation” and found 10,796 articles. To narrow the focus, I limited the search to those papers which were peer-reviewed and published in the last ten years, yielding 7,455 articles in the ERIC database, and 7,134 in PsycINFO. I further limited the search to “self-regulation” AND “developmental psychology” OR “child psychology” and found that there were 1,920 articles in ERIC, and 1,520 in PsycINFO. This was still too extensive and required further refining. To narrow my focus to the context of the early learning kindergarten classroom, I performed a search of the terms “self-regulation” AND either “developmental psychology” or “child development” AND kindergarten, limited to the last 10 years, and found 95 papers. I completed a second search of the terms “self-regulation and kindergarten”, limited to the last 10 years to avoid limiting the scope *too* tightly, and found 105 results, most of which were duplicates of the first search, so the first 95 articles were retained for study. I scanned each paper manually for its definition of self-regulation. I excluded ten papers as irrelevant and grouped the remaining ones into definitional categories based on Burman’s (2015) analysis of relevant terms in the literature. See Figure 3 for a graphical representation of the systematic review process that I followed to put into context the kindergarten self-regulation literature.

Figure 3

Search Process for Self-Regulation Literature Focused on Kindergarten Classrooms



I present results of this systematic review of the literature in each definitional category in the following section for the purposes of examining how self-regulation is defined in the literature and for uncovering how educators might interpret the term. It is important to note that I

have not described the methodologies nor the results in detail because when the study relies on a different definition of self-regulation from the one I have adopted for this dissertation, the results are less relevant to this study and are much more relevant to other constructs they are measuring such as self-control, which is not the focus of this dissertation. Furthermore, there is a gap in the literature about how educators understand or facilitate self-regulation, including how they manage their own stress.

As noted above, whereas Burman's research considered all contexts of the self-regulation literature, I focused exclusively on the kindergarten self-regulation research to see which of these categories were represented in the kindergarten context. Table 2 illustrates the concentration of the literature across these six identified categories. For clarity, they are listed in the order that they are discussed in the following sections. In each subsequent category section, I first introduce the category with references to key papers in the field that I read during my initial exploratory research to define each category and establish context. The remainder of each category section synthesizes the kindergarten research in that respective category.

Table 2

Concentration of the Literature Emerging from a Systematic Review, Grouped Across Burman's (2015) Six Identified Categories

Category	Relevant Articles	Focus (per categorical definition)
Learning and Learning Strategies (n=5)	(Neitzel, Alexander, & Johnson, 2016) (Martin & Kragler, 2012) (Hwang, Gorrell, & Chung, 2003) (Bodrova & Leong, 2008) (Manning et al., 1994)	Academic self-regulation (behaviour) Self-monitoring understanding of text Metacognitive regulation of behavioural strategies Self-talk to assist with academic tasks

Category	Relevant Articles	Focus (per categorical definition)
		Self-talk to assist with academic tasks
Agency, Self-Determination, Internal and External Locus of Control (n=1)	(Gambro & Switzky, 1991)	Self-reward behaviour
Social Behaviour (n=2)	(Brooker et al., 2016)	Inhibitory control connected to social anxiety
	(S. A. Denham et al., 2014)*	Social learning
Self-Monitoring (Personality; n=1)	(Hotulainen & Lappalainen, 2011)	Self-perception, self-concept, socio-emotional problems
Self-Management / Monitoring (n=7)	(Pratt et al., 2016)	Self-monitoring thoughts for compliance
	(Brotman et al., 2013)	Positive behaviour support for child conduct problems and behaviour regulation
	(Dawson-McClure et al., 2015)*	Positive behaviour support for child conduct problems and behaviour regulation
	(von Salisch et al., 2015)	Executive function and emotion knowledge, attention problems
	(Kim et al., 2016)	Attentional control
	(Berry et al., 2014)	Cognition and temperament
	(Sasser et al., 2015)	Executive function, cognition
Self-Control (n=49)	(Eiden et al., 2009)	Behavioural regulation
	(Howse et al., 2003)	Behavioural regulation
	(Zeytinoglu et al., 2017)	Behavioural regulation
	(Dollar et al., 2017)	Effortful control
	(Eiden et al., 2016)	Effortful control
	(Somech & Elizur, 2012)	Effortful control
	(Bassett et al., 2012)	Executive function and control
	(Talwar et al., 2011)	Preschool Self-Regulation Assessment (PSRA), measuring executive control
	(Barbarin, 2013)	Executive function and control
		Emotion regulation and control

Category	Relevant Articles	Focus (per categorical definition)
	(Hirschler-Guttenberg et al., 2015)	Emotion regulation and control
	(Joy, 2017)	Emotion regulation and control
	(S. A. Denham et al., 2014)*	Socioemotional learning
	(Webster-Stratton et al., 2008)	Socioemotional learning
	(Fitzpatrick & Pagani, 2013)	Attention focus
	(Leyva & Nolivos, 2015)	Attention focus Impulse control
	(Timmons & Pelletier, 2016)	Impulse control
	(Strommen, 1973)	Behavioural inhibition
	(McIntyre et al., 2006)	Delay of gratification
	(Ponitz, McClelland, Matthews, & Morrison, 2009)	Head Toes Knees Shoulders task of behavioural regulation
	(Ponitz et al., 2008)	Head Toes Knees Shoulders (HTKS) task of behavioural regulation
	(Rorhbeck et al., 1991)	Self-Control Rating Scale (self-report measure of self-control)
	(Graziano & Hart, 2016)	Behavioural regulation using HTKS
	(Köckeritz et al., 2010)	Behavioural regulation using HTKS
	(McClelland & Cameron, 2012)	Behavioural regulation using HTKS
	Note: there were 12 other papers using the HTKS task that were not specifically named in this review as they used the same measure and definition of self-regulation and did not contribute anything substantially different from the above 3 studies)	
	(Dawson-McClure et al., 2015)*	Self-control; Dinosaur school
	(Denham et al., 2012)	Self-control; Dinosaur school
	(Graziano & Hart, 2016)	Self-control; Dinosaur school Kids in Transition to School (school readiness program)
	(Webster-Stratton et al., 2008)	Self-control; Dinosaur school
	(Upshur et al., 2013)	Self-control and socioemotional learning; Second Step
	(Pears et al., 2013)	Kids in Transition to School (school readiness program)
	(Pears et al., 2012)	Kids in Transition to School (school readiness program)
	(Pears et al., 2015)	Kids in Transition to School (school readiness program)

Note. * Indicates that the study was referenced under more than one category

2.5.1. Category 1: Learning and Learning Strategies

Self-regulation in school settings typically focuses on learning strategies (usually metacognition and motivation; Effeney, Carroll, & Bahr, 2013; Zimmerman, 2000). Learning might involve a student's executive functioning skills and ability to control one's attention toward a teacher. Self-regulated learning refers to an individual's ability to set learning goals and subsequently control, monitor, and regulate one's own behaviours in response to specific environmental conditions to meet those goals (Pintrich, 2000). This may include managing cognitive and affective aspects of learning such as strategy use, motivation, and behavioural action control. When I examined the kindergarten literature, five papers emerged from the systematic review illustrated in Figure 3 which define self-regulation in kindergarten classrooms. Neitzel, Alexander, and Johnson (2016) investigated children's interest-based activities in the home and their subsequent 'academic self-regulation'. They described academic self-regulation as a behaviour-based measurement which included metacognitive talk and progress monitoring. Behavioural measures of self-regulation included coding of metacognitive talk (internal self-talk) and progress monitoring. Neitzel's conceptualization is rooted in specific learning strategies failing to encapsulate the full spectrum of the meaning of self-regulation. Furthermore, the authors acknowledged that there are measurement challenges, even given this definition, because of the validity of children's verbalizing of their own internal processes.

Several other studies similarly used a definition that aligned more with learning strategies than self-regulation itself as defined by Shanker (2016). Martin and Kragler (2012) examined kindergarten children's self-monitoring and understanding of texts while reading. Similarly, Hwang, Gorrell, and Chung (2003) studied self-regulated learning, referencing self-efficacy, social learning, and self-evaluation, yet remained focused on the metacognitive regulation of

behavioural strategies during learning. Two other studies focused on learning strategies (Bodrova & Leong, 2008; Manning, White, & Daugherty, 1994) defined self-regulation as a child's ability to master their own behaviour by practicing control over impulsive behaviour, which is more closely connected to self-control than self-regulation. Each of these studies used the term self-regulation to refer to one's ability to self-talk to assist with academic skills. None of the studies referred to self-regulation as a means of managing one's own energy and tension, the definition and framework used in the Kindergarten Program document (Ontario Ministry of Education, 2016b). Consequently, their methodologies and findings may hold strong importance to understanding learning strategies, but the studies do not contribute to understanding a neurophysiological framework of self-regulation since they represent just one small portion of neurophysiological self-regulation. These definitions may overlap with definitions of agency and self-determination (such as self-directness) as described in the following section.

2.5.2. Category 2: Agency, Self Determination, Internal and External Locus of Control

A second category of interpretation of self-regulation definitions includes agency and self-determination. Motivational researchers (e.g., Grolnick & Ryan, 1989) utilize theories such as self-determination and the sub-components of autonomy and competency in self-regulation. Research supports that children are self-determined to develop self-regulation capacities independently (Grolnick, 2009). Grolnick found when autonomy and structure are provided (e.g., through positive parenting practices), children are more likely to show autonomous motivation and self-regulation. Motivation researchers believe that self-regulation is intentional and a conscious goal-directed process (Boekaerts & Cascallar, 2006). The assertion that self-regulation is about goals and performance needs to be carefully interpreted. If educators focus on cognition and metacognition alone, we leave out important automatic processes such as scanning the

environment for safety cues and responding to perceived threats in the environment which are beyond our conscious control but, nevertheless, important to self-regulating (managing our energy and tension). With this in mind, I looked to see which specific kindergarten self-regulation literature focused on agency and self-determination.

While much research exists on agency and self-determination for older children, only one paper emerged from this systematic review which focused on self-regulation in kindergarten. Gambro and Switzky (1991) tested the validity of motivational orientation and self-regulation in young children. Self-regulation in this paper was related to how internal self-standards and external environmental demands interact to affect self-reward behaviour in children. Measurements of self-regulation included monitoring time spent on task during prescribed activities (self-monitoring), what they termed *self-regulatory performance* behaviours. However, self-regulation is not a prescribed set of behaviours as previously discussed, but rather a more comprehensive process of responding to stressors to effect energy and tension levels as defined in the current study, which of course, may subsequently affect behaviour. So, although agency and self-determination are important aspects of development and motivation, they do not encompass self-regulation as management of energy and tension, though they are clearly related. Other behaviours, such as social behaviours, may also be entrenched in the definition, and are discussed below.

2.5.3. Category 3: Social Behaviour

Social behaviour is another example of a construct that is involved in self-regulation but does not necessarily represent the entire concept of Shanker's (2016) self-regulation. An individual's self-regulation affects that of others, and we each have individual differences in self-regulatory strength, content and outcome goals, and strategies. These individual differences in

orientation influence our social capacities like forgiveness, trust, commitment, and relationship well-being (Fitzsimons & Finkel, 2011). However, there is very little kindergarten self-regulation research on the social aspects of self-regulation. Burman et al (2015) found that less than 1% of the self-regulation research overall was focused on the social behaviour category and my systematic review supported this finding.

My review yielded only two kindergarten self-regulation studies connected to social aspects of self-regulation. One study (Brooker, Kiel, & Buss, 2016) discussed inhibitory control, effortful control, cognitive control, and executive function as dimensions of self-regulation which are connected to later social and non-social fear and social anxiety risk factors. There is overlap with self-control as opposed to self-regulation. Similarly looking at control, the other study (Denham, Bassett, Zinsser, & Wyatt, 2014) defined self-regulation with a social emotional learning (SEL) lens, as the ability to monitor and modify one's emotions to aid in coping as well as appropriately expressing emotions, executive function, and inhibitory control. Using this definition, self-regulation was seen more as social learning related to school adjustment and academic success with overlaps with emotion control. So, while the category of social behaviour emerged as being implicated in self-regulation (Burman et al., 2015), this is not enough on its own to represent the full nature of self-regulation in the context of the network of definitions. One might consider, then, how other aspects of the self beyond motivation, learning, and social behaviour might be involved, such as personality.

2.5.4. Category 4: Self-Monitoring (Personality: Self-Perception, Personality Traits, and Reflectiveness)

Personality has shown to be connected to self-regulation in the research. For example, Sakairi, Nakatsuka, and Shimizu (2013) suggest that humans have a need to monitor their own

psychological and physiological states as well as develop a means of measuring and adjusting those states, including activation strategies and relaxation techniques. We all have individualized characteristics or traits which help or hinder these processes. There is some ambiguity in the literature when personality traits and self-regulation are discussed simultaneously. Personality trait approaches consider qualities (e.g. vulnerability, aggression) as relatively stable across time and context, whereas self-regulation theory from a social-cognitive perspective conceives personality as the outcome of contextually-based cognitive processes (Matthews et al., 2000). This research shows the importance of individual response to affect, reflection on one's individuality, the importance of context on ever-changing responses, and an underlying biological component (i.e. neurological mental activity). I examined the kindergarten literature in these areas, finding limited results for this population, perhaps because personality becomes more constant later in childhood. The results of the literature are summarized below.

In terms of the kindergarten context, the literature on self-monitoring was limited. One paper emerged from the systematic review, which was a 15-year longitudinal study that looked at the relationship between kindergarten teachers' socio-emotional ratings of children and the child's self-perception, self-worth, and social competence (Hotulainen & Lappalainen, 2011). Self-perception and self-concept were highly relevant to socio-emotional problems and general well-being, including internalizing behaviours (depression and anxiety) and externalizing behaviours (aggression, 'delinquency'). Socio-emotional skills were shown to affect self-regulation. The authors did not present a clear definition of self-regulation and acknowledged the limitation that a child's ability to determine his/her relative self-regulation skills via self-report would be hampered by his/her inability to understand its meaning. The scarcity of research related to kindergarten self-monitoring may be due to its potential relevance to an older population rather

than early childhood which were the search parameters. Self-reflection may be an important part of self-regulation, but at this age, self-regulation may be more about awareness and experience in the moment rather than the subsequent metacognitive process of self-monitoring. There are, however, other aspects of self, which may be more relevant, such as self-management and metacognition.

2.5.5. Category 5: Self-Management / Monitoring (Including Self Evaluation, Behaviour Modification, Cognition)

Metacognitive knowledge is thought to aid in the planning aspect of self-regulation (Garner, 2009). Examples include planning and goal-setting prior to learning and self-monitoring during performance through, for example, self-questioning (Boekaerts & Niemivirta, 2000). This cognitive-focused domain of self-management includes mental processes such as sustaining and switching attention, sequencing thoughts, consciously processing several chunks of information, ignoring distractions, and inhibiting impulses (Garner, 2009; Shanker, 2012). If one focuses on self-monitoring and management (cognitive behavioural strategies), however, they may see self-regulation as behavioural or cognitive, which is not as the same as understanding self-regulation as the ability to manage energy and tension. The interaction of stressors in the cognitive domain with other domains of self-regulation (biological, emotion, social, and prosocial) needs to be considered carefully and holistically in context as a precursor to self-management, for one who is not physiologically regulated cannot self-manage. If one's nervous system is physiologically dysregulated or overwhelmed, one does not have an adequate means to control or manage one's own behavioural responses.

In terms of the volume of information available, self-management / monitoring (including self-evaluation, behaviour modification, and cognition) was a significant area of focus in the

context of kindergarten self-regulation, and two themes emerged, those of compliance and of cognition (executive control).

First, I found that compliance was a common theme, including behavioural aspects of self-regulation, behavioural management/modification and intervention, positive behaviour support, and conduct problems, supported by three papers looking at these foci. Pratt, Lipscomb, and McClelland (2016) examined overt and behavioural compliance at age 3 appraised by parents and teachers. They defined self-regulation as an ability to monitor and modulate one's own thoughts, feelings, and behaviours, including compliance and cooperation. Behaviourally focused papers such as this one are limited, though, in that they are looking at compliance more so than holistic self-regulation. Similarly, both Brotman et al (2013) and Dawson-McClure et al. (2015) referred to conduct problems and behavioural dysregulation among children, with an intervention based on the implementation of positive behaviour support and management to promote social-emotional skills which the intervention surmised were foundational to self-regulation. Outcome measures were behavioural (school achievement scores and teacher-rated academic performance; Brotman et al., 2013) and were not specific to self-regulation. Future work in exploring what might mediate parenting, classroom quality, and child self-regulation effects on academic and behavioural outcomes was suggested, which perhaps indicates acknowledgement that there is a mediator to these outcomes and that perhaps this mediator is self-regulation.

A second theme in this area (self-management and monitoring) focused on cognition (executive function and attentional control) and I found an additional four studies corresponding to this theme. Von Salisch, Hänel and Denham (2015) examined executive functioning and emotion knowledge, as well as changes in attention problems, which they used as means of

measuring what they called self-regulation. Similarly, Kim et al (2016) examined the contribution of attentional control on students. Berry, McCartney, Petrill, Deater-Deckard, and Blair (2014) looked longitudinally at how experiences in childcare were related to the development of attention and self-regulation showing the impact of earlier childcare quality on the child's ability to delay gratification and control impulsivity—described as the set of behaviours that teachers see as desirable.

Measurement itself in this category was behaviourally or cognitively based. Measurements used in this category included such behavioural measures as the Head Toes Knees Shoulder (HTKS) task, a measure of working memory and attention-focusing (Kim et al, 2016) and a 4-point Likert scale of exhibited behaviours from the Child Behavior Rating Scale (Bronson et al, 1995). As a result, I did not describe the methodology here because I saw little value in replicating these measures and methods because they were inconsistent with my core definition. While the findings may well apply to researchers using a behaviourally based definition of self-regulation, it was simply the definitions I was interested in for the purpose of this literature review.

The aforementioned studies define self-regulation as one's ability to self-monitor. Other similar studies examined self-regulation as executive function and opposition-aggression (Sasser, Beekman, & Bierman, 2015) or mediated by consciously controlled executive function (Bindman, Pomerantz, & Roisman, 2015). These measures are based on cognitive functioning, which may contribute to understanding self-regulation but is only one small aspect of self-regulation as described in Shanker's (2016) framework above. The themes of compliance and executive control (in terms of impulsivity, for example) discussed in this section overlap with

self-control and contribute to what may be the largest misunderstanding in self-regulation – that self-regulation is not the same thing as self-control.

2.5.6. Category 6: Self-Control (Including Emotional Regulation and Emotional Control)

I discovered that self-control was the term most highly connected to self-regulation. There were more papers using a self-control definition of self-regulation than any of the other categories combined. Muraven and Baumeister (2000) describe self-control as the exertion of control over the self by the self – when a person tries to change how they are thinking, feeling, or behaving, including delaying gratification and overriding or inhibiting drives. This competes with an individual's automatic responses, employing conscious effort to do so. Carver and Scheier (2000) conceptualize self-control as a discrepancy reduction between the self and standard by overriding the self's existing thoughts, feelings, and behaviours, some of which cause stronger urges (and thus require greater effort to override) than others. Executive processes enable individuals to control themselves through inhibition of inappropriate responses. Lack of action control may be manifested when the individual says or does inappropriate things, takes risks, or (particularly when frustrated) has difficulty in controlling his or her emotions (Garner, 2009). Garner discovered that poor impulse control was correlated with metacognitive strategy use and academic effort regulation. Interestingly, capacity for empathy was also correlated with these executive functions and suggested that these overlaps relate to the human ability for protection and connection in human relationships, because the capacity for both requires working memory, impulse inhibition, and the ability to take another's point of view. Garner's study highlights the overlapping nature of many of these constructs. Another such term connected to self-regulation in this area, with potential overlaps such as empathy and impulse control, is that of emotion regulation.

Emotion regulation overlaps with self-control and self-regulation and it is sometimes difficult to discriminate between them (Vohs & Baumeister, 2016). Emotion regulation refers to the processes of monitoring, evaluating, and modifying emotional reactions (Compas et al., 2014), where children first learn to perceive their own emotions, reflect on them in context, and then manage them through environmental and cognitive manipulations (Bown, 2010). Gross (2007) indicated five domains of emotion regulation: situation selection (avoiding situations which provoke negative emotions), situation modification (modifying the environment to avoid negative emotion), attentional deployment (changing one's attention, such as distraction), cognitive change (changing how one thinks in a situation to decrease negative emotions), and response modulation (how one responds to an emotional experience, such as relaxation techniques). Emotion regulation focuses on one's ability to control his/her own emotions and subsequent behavioural responses to them, which indicates self-control and is not necessarily synonymous with self-regulation. Self-regulation looks at how emotion-based responses may interact with the abovementioned cognition as well as other domains, including the social domain.

I discovered that a self-control definition was dominant in the literature on kindergarten self-regulation. To be more concise to self-regulation, I excluded studies that specifically used the term self-control from this review of the literature. Of the remaining ninety-five articles, forty-nine of the ninety articles that emerged still defined self-regulation as self-control. Additionally, many of the articles I discussed in the above categories included elements of self-control such as attentional control. The articles below, however, focused specifically on self-control, emotional regulation or control, willpower, grit, and the kindergarten self-regulation contexts. It is important to make these distinctions because self-control implies a conscious

ability to control one's own behaviour, whereas there may be elements of self-regulation which suggest underlying physiological, unconscious precursors to conscious behavioural control.

The majority of studies emerging from my systematic review on kindergarten self-regulation used a self-control model, including behavioural regulation (Eiden, Colder, Edwards, & Leonard, 2009; Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003; Zeytinoglu, Calkins, Swingler, & Leerkes, 2017), effortful control (Dollar, Stifter, & Buss, 2017; Eiden, Edwards, & Leonard, 2007; Somech & Elizur, 2012), executive function and control (Bassett, Denham, Wyatt, & Warren-Khot, 2012; Talwar, Carlson, & Lee, 2011), emotional regulation and control (Barbarin, 2013; Hirschler-Guttenberg, Golan, Ostfeld-Etzion, & Feldman, 2015; Joy, 2017), socioemotional learning (Denham et al., 2014; Webster-Stratton, Reid, & Stoolmiller, 2008), attention focus (Fitzpatrick & Pagani, 2013; Leyva & Nolivos, 2015), impulse control (Leyva & Nolivos, 2015; Timmons & Pelletier, 2016), behavioural inhibition (Strommen, 1973), and delay of gratification (McIntyre, Blacher, & Baker, 2006). Many of these researchers used such measures as the Head Toes Knees Shoulders (HTKS) task of behavioural regulation (Ponitz, McClelland, Matthews, & Morrison, 2009; Ponitz et al., 2008), the Preschool Self-Regulation Assessment (PSRA) which measures hot and cool executive control (Bassett et al., 2012), and the Self Control Rating Scale (Rorhbeck, Azar, & Wagner, 1991) which is a self-report measure of self-control. The HTKS was the most commonly used measure noted among the self-control literature, used in 15 of the emerging papers (e.g., Graziano & Hart, 2016; Köckeritz, Klinkhammer, & von Salisch, 2010; McClelland & Cameron, 2012). Some studies highlighted specific curricula said to target self-regulation but defined self-regulation in self-control terms, including Dinosaur School (Dawson-McClure et al., 2015; Denham et al., 2012; Graziano & Hart, 2016; Wenz-Gross, & Reed, 2013; Webster-Stratton et al., 2008), Second Step, which

focuses on socioemotional learning targeting child self-regulation (Upshur et al., 2013), and Kids in Transition to School which focuses on school readiness including self-regulation (Graziano & Hart, 2016; Pears et al., 2013; Pears, Kim, & Fisher, 2012; Pears, Kim, Healey, Yoerger, & Fisher, 2015). All of the aforementioned research is focused on self-control, which is behavioural, yet self-control models assume that a child's behaviour is always under their conscious control. On the contrary, as suggested above, behaviour might be mediated by unconscious, physiological processes that are not considered in a self-control model.

In summary, there were no studies which specifically examined self-regulation as defined by Shanker's (2016) comprehensive framework and the *Kindergarten Program* (Ontario Ministry of Education, 2016b). Most targeted self-control, a related yet distinct construct. Since the research studies varied in definition, it was clear that a consistent understanding of what self-regulation means was critical to the field in determining appropriate ways to facilitate the development of self-regulation. In Ontario's kindergarten classrooms, more research is needed to capture what self-regulation looks like in practice. Is it being implemented as mandated in the curriculum document, following Shanker's framework of self-regulation in the early years?

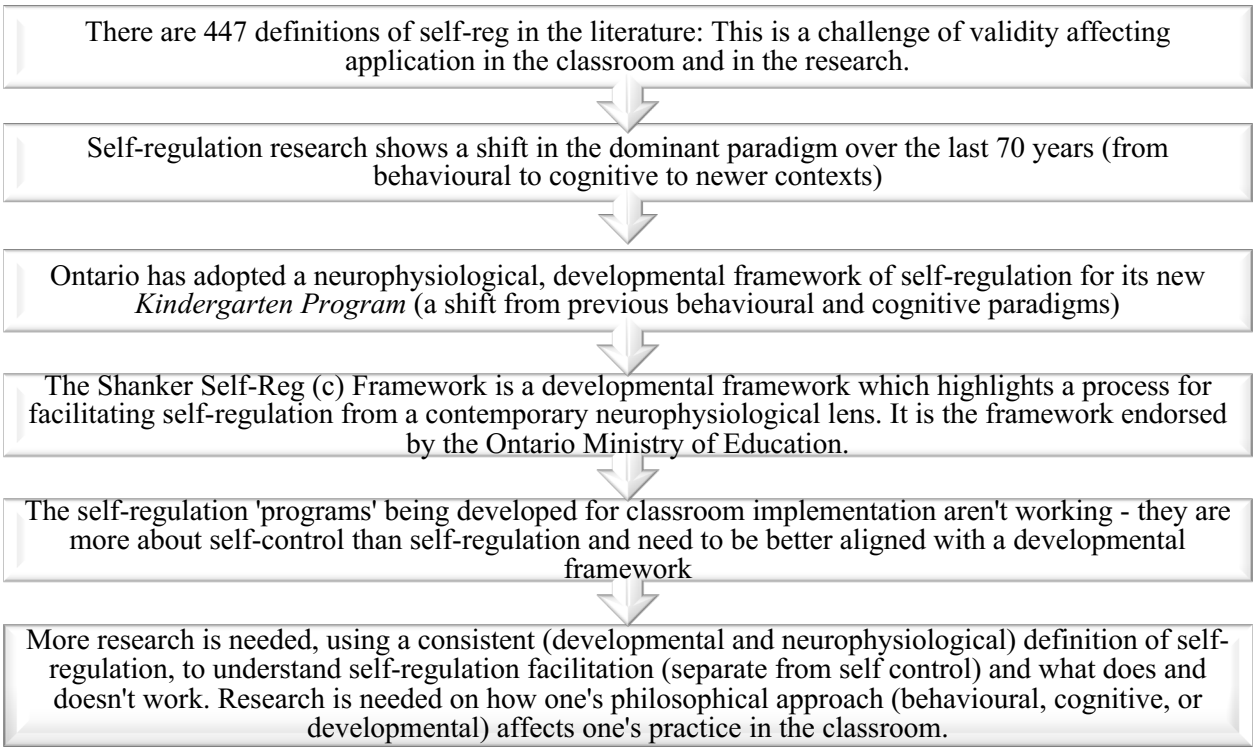
2.6. Summary and Emerging Gaps in the Literature

Figure 4 summarizes the research and reveals that while behavioural research does continue, there is a growing area of research in self-regulation across many contexts (e.g., education, mental health, physical health; Post, 2009) which describes self-regulation as how we manage energy and tension, not how we control our behaviour (Shonkoff & Phillips, 2000). This neurophysiological research is the basis for such organizations as Harvard's Centre on the Developing Child and Alberta's Family Wellness Initiative which translate years of research on attachment, early experiences, social determinants of health, and brain-body science of the

nervous system to make them accessible to families, educators, and community clinicians. This neurophysiological lens is an alternative to a behavioural lens to focus not on changing behavioural symptoms but on reducing their underlying, upstream causes in early child development. When educators believe that behaviours are under the child's control, they resort to punitive responses (Dagnan et al., 1998) and reactive responses to behaviour such as time-out and loss of privileges (Nungesser & Watkins, 2005).

Figure 4

Summary of Literature Review



This growing area of neurophysiological research is reflected in Ontario's *Kindergarten Program* (Ontario Ministry of Education, 2016b). This shift in the research is evident in Ontario's educational literature which is directed at the professional development of educators points to Shanker's model of Self-Reg, with multiple citations of his work throughout the educator documentation (Best Start Expert Panel on Early Learning, 2007; McCain et al., 2011;

Ontario Ministry of Education, 2016b) and the use of his videos (*Edugains Kindergarten Home*, 2017; *EduGains Viewing Guide*, 2012). However, Shanker's Self-Regulation framework has not yet been empirically studied. With such a vast volume of literature on the science supporting the *Kindergarten Program*, it is possible that educators are overwhelmed by the information, making it difficult to know how to effectively implement self-regulation in their programs. To support educators in designing appropriate environments and practices in the classroom, it is important to research what kindergarten educators currently understand self-regulation to be, since their understanding will guide their facilitation of self-regulation strategies in the classroom and suggest possibilities for future professional development that could very much change the physical and social-emotional landscape of the classroom.

Chapter 3: Methods

The current mixed methods study examined kindergarten educator understanding and facilitation of self-regulation in their classrooms through surveys, interviews, text analysis of report cards, and classroom observations of kindergarten educators [teachers and Early childhood Educators (ECEs)] in a small northern Ontario school board. The first phase of data collection entailed analyzing survey results of demographic information and initial information about educator definitions of self-regulation (n=29). The second phase entailed analyzing data from Kindergarten Communications of Learning (report card) text and interviews from six classrooms (six teachers and their six ECE teaching partners) to examine how educators assess self-regulation in their students (through the report card process) and how they facilitate it (through interviews). The final phase analyzed classroom observation data (through a checklist of educator self-regulation behaviours developed from pedagogical documentation described below). Due to attrition, eight educators were observed (four teachers and four ECEs). The observation checklist included the way that educators structured their physical classroom environments to facilitate the process of self-regulation. Together, survey, interview, Communications of Learning, and observation data was analyzed to examine how kindergarten educators understand and facilitate self-regulation in the classroom and what impacts their practice.

3.1. Purpose Statement

The objective of the current study was to analyze how kindergarten educators understand and facilitate self-regulation in their students, using the framework of the Ontario *Kindergarten Program* (Ontario Ministry of Education, 2016b).

3.2 Research Questions

My research questions stemmed from one overarching question: *How do kindergarten educators understand and facilitate the process of self-regulation in the classroom?* My specific research questions were as follows:

1. How do kindergarten educators (teachers, early childhood educators) describe self-regulation?

a) How do educators define self-regulation?

b) How do educators describe the self-regulatory capacities of their students?

2. How do kindergarten educators facilitate the self-regulation process (as per the Self-Regulation and Well-Being frame of the Ontario Kindergarten Program) in their classrooms?
3. Is there a connection between educator understanding of self-regulation in the classroom and: educator experience, role (teacher or ECE), or professional development experience?

3.3. Mixed Methods Design

3.3.1 Rationale

The research questions are varied in focus and best addressed through the collection and integration of both qualitative and quantitative elements in a mixed methods design. Mixed methods is a research methodology in the social, behavioural, and health sciences which involves the collection of both quantitative and qualitative data and integrated analysis of both (Creswell, 2015).

Qualitative data can provide a detailed understanding of a problem through exploration of the problem in great depth, and quantitative data can provide a general understanding of a larger

sample of participants (Creswell & Plano Clark, 2018). Quantitative data collection allows for the collection of data describing educator understanding of self-regulation and should reduce some of the bias that may be inherent in more qualitative methods that are less objective because they require interpretation (Creswell, 2015). Qualitative and quantitative data provide different perspectives yet have limitations such as the loss of ability to generalize when a small qualitative sample is used, or the loss of understanding of the individual when a large quantitative sample is used. However, through mixed methods, these limitations offset each other and provide a more complete understanding of the research problem than either one on its own (Creswell & Plano Clark, 2018). The qualitative elements of the interview expand on the data collected in the survey, providing a richer understanding of educator understanding and facilitation of self-regulation in the kindergarten classroom.

3.3.2. Study Design

This study used a triangulation design which involved collecting qualitative and quantitative data, analyzing them independently, then merging the data and analyzing it in the context of one another to confirm and corroborate findings, and to discover deeper insights than when looking at the sources on their own (Creamer, 2017). My data included quantitative data: a demographic survey allowing for data analysis using variables such as teacher experience, professional development, role (teacher or ECE), and an observational checklist (Self-Regulation Classroom Environment and Implementation Checklist; SCEIC), developed for the purposes of this study, describing educators' facilitation of self-regulation in their classroom. Qualitative data sources included examining classroom observations (via zoom) of educator facilitation recorded on the SCEIC, educator (teacher and ECE) interviews, and Communication of Learning data for themes. Communication of Learning is the Ontario Ministry of Education term for kindergarten

report cards which are based on describing student learning through anecdotal evidence (Appendix A). Each data source provided information about the understanding and facilitation of self-regulation, and together the data sources were then triangulated to better answer the research questions, providing more information than the two sources alone. Table 3 outlines the qualitative and quantitative sources of data. The advantage of this design is that it supported a detailed exploration of integrated results.

Table 3

Research Questions Connected to Data Collection Tools

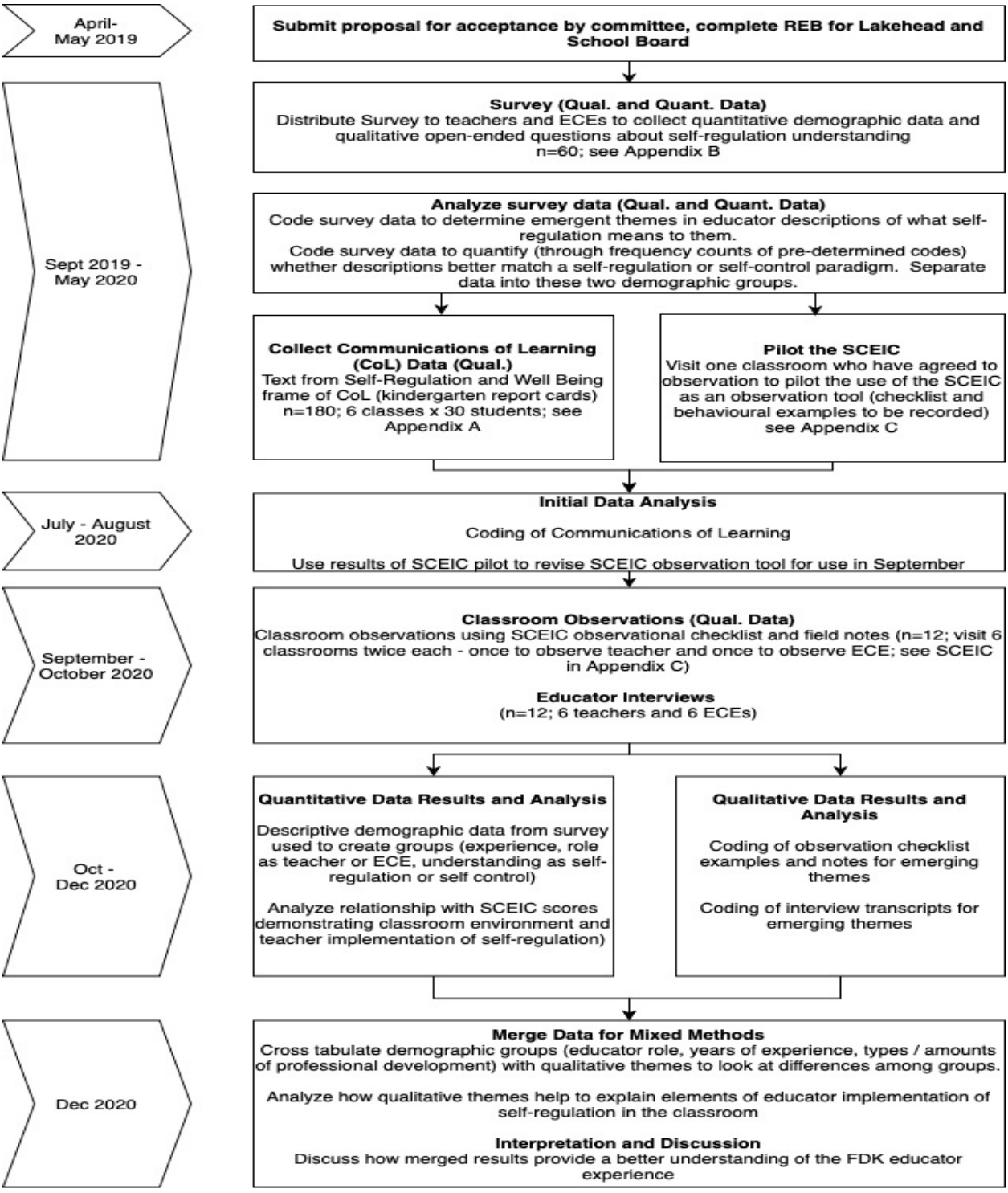
Research question	Data collection tool and connections	Quan / Qual / Mixed	Description
1. How do kindergarten educators (teachers, early childhood educators) describe self-regulation? a) How do educators define self-regulation? b) How do kindergarten educators describe the self-regulatory capacity of their students?	Survey	Descriptive /Quantitative	Demographics, definition of self-regulation
	Interviews	Qualitative	Definition, description of student self-reg behaviours
	Communications of Learning (Report Cards)	Qualitative	description of student self-reg behaviours
2. How do kindergarten educators facilitate the self-regulation and well-being frame of the Ontario *Kindergarten Program* (curriculum)?	Classroom Observation using the SCEIC (described in Section 3.8.4 below)	Quantitative	Frequency / number of behaviours
	including Observation Field Notes (qualitative)	Qualitative	Description of examples of behaviours
	Interviews	Qualitative	Open-ended questions
3. Is there a connection between educator understanding of self-regulation in the classroom and: educator experience, role (teacher or ECE), or professional	Integration of descriptive quantitative statistics describing the participants (survey data; descriptions and facilitation behaviours that were quantified through frequencies) and qualitative data demonstrating educator	Mixed Methods	Organize / describe findings by demographic groupings (experience, professional development, role)

development experience?	understanding of self-regulation

Interpretation of findings provided a better understanding of the kindergarten educators' experience rather than either quantitative or qualitative data alone, including discussion of congruence and/or discordance between qualitative and quantitative findings. Figure 5 provides an outline and timeline of the procedural design.

Figure 5

Outline and Timeline of Procedural Design



3.4. Philosophical Underpinnings of the Research Design

There are a variety of typologies of mixed methods research (Rossman & Wilson, 1985) including corroboration (triangulation), elaboration, and initiation. This study employed both corroboration (using different forms of data to corroborate each other including interviews and observations) as well as an initiation design, which explains differences in practice when different paradigms are understood (Creamer, 2017). It was anticipated that there would be areas where the data did not converge. For example, it was unlikely that all educators would approach self-regulation in the same way, and it was the goal of this study to identify and explore why. As (Rossman & Wilson, 1985) state, initiation designs can initiate interpretations and conclusions, suggest areas for further study and analysis, or reframe research questions.

Underlying my research design was a philosophy of critical realism. Critical realism assumes an ontology where knowledge is partial and context-dependent, and critical realists seek to understand social processes through their underlying causes (Creamer, 2017). In the case of my study, the context was important, and I sought to understand not just a measurement or test of educator understanding, but the components which contributed in varying ways to context-dependent educator practices. Critical realists believe that many valid interpretations of the same phenomenon are fundamental because our perception of the world is a construction of it influenced by our experiences (Creamer, 2017). My study sought to explore how the different interpretations of the phenomenon of self-regulation connect to and influence classroom philosophies and practices. Methodologically, critical realism asserts that causality is bound by context, and should not be studied through controlling for extraneous variables (Creamer, 2017). It is for this reason that I did not design a more positivistic, outcomes-based study. Rather than looking at which programs might change specific behavioural outcomes and controlling for the

influential variables, I acknowledge that self-regulation is entirely too complex to be studied in this manner. My data collection processes were designed to capture context, themes, and multiple realities of different educators.

3.5. Recruitment Procedures

After receiving Lakehead REB approval, and approval of the school board, I contacted the school board superintendents who in turn contacted the principals of all schools with kindergarten programs (See Appendix E for Principal contact letter). The superintendent distributed participant letters to each of the kindergarten educators (teachers and ECEs; see Appendix F) with a link to complete an optional electronic survey. They were also asked in this subsequent email about their prospective participation in further elements of the study (Communications of Learning, class observations, one-to-one interviews with teachers and ECEs). To increase participation, two subsequent emails were sent to potential participants (once by the superintendent and once by the researcher) to again provide the study's information and direct survey link within the email.

3.6. Incentives for Participation

As a token of my appreciation, at the completion of my study, I gave each of the six participating classrooms a resource package containing a copy of Stuart Shanker's book, *Self-Reg Schools: A Handbook for Educators (Shanker & Hopkins, 2019)* as well as an individualized selection of resources summarizing the Shanker Self-Reg framework. These were individually selected based on classroom needs and interest as determined in the interviews, printed in colour and included in a folder for the classroom to keep and reference in the future. As a further token of my appreciation, I also offered a one-day workshop for the board's kindergarten educators, outlining Shanker Self-Reg and the science behind it. Due to the pandemic, this offer will remain

open until face-to-face training is more feasible. Educators who participated in the elements of the study will be invited to participate and the school boards may elect to include other staff from across the board as well.

3.7. Research Participants

Participants were a sample of educators from a small northern Ontario board, which was chosen because of proximity to the researcher. The board includes 29 kindergarten classrooms plus 4 combined Kindergarten/Grade 1 classrooms. In the entire board, there are 60 kindergarten educators, including 35 kindergarten teachers and 25 Early Childhood Educators. Participants who responded were 29 kindergarten educators (15 teachers and 14 early childhood educators), all female (as this was the only population who responded), who work in kindergarten classrooms in a small northern Ontario school board. Teachers had an average of 12 years of experience and ECEs had an average of 11 years of experience in their current roles as educators. Their professional development experience and familiarity with key resources and available programs varied and will be discussed further in Chapters 4 and 5.

3.8. Data Collection Tools

3.8.1. Survey

The survey (see Appendix B) included demographic questions [(years of teaching experience, role (teacher or ECE), professional development experience]. Participants identified self-regulation workshops they had completed and rated their familiarity with selected educational resources using a five-point scale (Ontario Ministry of Education kindergarten documents and resources, and several commonly known self-regulation programs), where a score of one indicated having never heard of the resource, and five representing being very familiar with the resource. It included subsequent open-ended questions asking educators to

describe self-regulation (what it means, what a well-regulated student looks like, what a poorly regulated student looks like) and how they facilitate self-regulation in their classrooms.

Surveys also included a question asking respondents if they would agree to have their classroom observed, to participate in an approximately 60-minute semi-structured interview one to one with teacher and ECE separately about their beliefs and practices. It was important to have both the teacher and the ECE agree to participate in sharing their Communication of Learning comments, classroom observation, and educator interviews in order to maintain confidentiality of both parties. Only classrooms where both the teacher and ECE agreed to participate were considered for further participation because having both perspectives was important to gaining an understanding of the similarities and differences between teacher and ECE understanding and facilitation of self-regulation, as they would have been exposed to different types of pre-service training and professional development. I was seeking to understand some of the influences on the frameworks adopted by educators with different roles, training, and experience. Furthermore, classroom observations would involve observing both educators in the same environment, so mutual agreement was necessary. Passive parent consent was required for classroom observations (although I did not collect observational data for students) and individual Communication of Learning data (though data reporting was anonymous). The data collected was kept confidential and focused on educator behaviour. The students were not identified by name and any student-based data (including children whose parents did not provide consent) was masked or removed (Appendix G).

3.8.2. Interviews

At a time and date that was convenient for educators, I interviewed the 6 teachers and corresponding 6 ECEs whose classrooms were selected for observations, interviews, and Communication of Learning collection, using the semi-structured interview questions to obtain a richer understanding of educator experience in facilitating self-regulation (see Appendix D for specific protocol and questions). Each educator was interviewed once for 60-90 minutes. I used the following published resources to guide the development of the interview questions since they are existing tools that are relevant to the self-regulation framework referenced in the *Kindergarten Program* (Ontario Ministry of Education, 2016b): The *Kindergarten Program* (Ontario Ministry of Education, 2016b) and The MEHRIT Centre's Self-Reg Rubric (Shanker, 2016; Appendix I)

The Self-Reg Competencies Rubric (The MEHRIT Centre, 2017) is a tool designed to help educators self-reflect on their own self-regulation *practices* in the classroom. This tool prompts educators to reflect on their competencies in each of the five principles of Shanker Self-Reg (which are described in the rubric, so no background in Shanker Self-Reg© was required). Educators selected where they felt they were on a scale ranging from emerging (just beginning to understand) to developing (gaining an understanding) to applying (using this principle in practice), to extending (fully embodying the principle in different contexts).

Because of the global COVID-19 pandemic in 2020, all schools were closed in March 2020 and teachers were not available for in-person interviews during this time. Instead, a revision to the procedure was approved by the REB to complete interviews via Zoom, an online videoconferencing service, as well as to add two questions about whether educators were able to facilitate the self-regulation and well-being frame of the program through remote instruction, and

if so, how. Because of when approval was received, two educators who had already been interviewed were contacted a second time via Zoom to ask these follow-up questions. For the remainder of participants, these questions were integrated into their single Zoom interview. The use of Zoom for interviews allowed audio-recording of interviews as well as automatic transcription of the interviews directly.

I interviewed the ECEs separately using the same interview questions and methodology to determine ECE understanding and beliefs. ECEs were interviewed separately from teachers so that neither one's responses would influence those of the other. Following the interviews, I used the saved audio files to transcribe each interview; while Zoom provides automatic transcription, it is sometimes inaccurate, so I cross-referenced with the audio recordings for accuracy. I then e-mailed the relevant transcription to each educator, asking them whether the transcription accurately described our conversations and whether they had any feedback. One educator provided further explanation of one of her comments which was misheard by the automatic transcription and the researcher via the audio recording, and that sentence was revised as per the educator's wording. Each interview was deemed accurate by the corresponding educator. I then entered the transcripts into Atlas.ti and coded them as described in the coding section below.

3.8.3. Communications of Learning

I contacted the six teachers who had participated in interviews and requested that they share with me the text from the Self-Regulation and Well-Being frames of their June 2020 report cards (via USB data stick or encrypted file sharing, whichever was most convenient for them). Due to work action occurring during the school year, February Communications of Learning consisted of a pared-down, single sentence in each of the four frames, so this information was not collected as planned. Communications of Learning data emerged from the more substantive

June Communications of Learning, which were based on observations made prior to the closing of schools due to the COVID pandemic. The teacher/ECE was responsible for removing any identifying information from the Communication of Learning before submitting it to me and I did a second review to remove any instances of identifying student information that were missed. The Kindergarten Communications of Learning are Ontario's kindergarten report cards, and unlike other drop-down types of reporting, are designed to be anecdotal descriptions in the teachers' words (see Appendix A). The intention of collecting this data was to examine teachers' descriptions of what self-regulation looks like in their students. All identifying information was removed, but all classroom parents were informed of this data collection and were able to contact the teacher to have their child's report card excluded from data collection shared with the researcher (Appendix G). No parents expressed concerns. The coding and analysis process are described below.

3.8.4. Self-Reg Classroom Environment and Implementation Checklist (SCEIC)

I contacted the same 12 educators (six teachers and their ECE teaching partners) to invite them to participate in classroom observations. Due to COVID restrictions, I was unable to visit the classrooms face-to-face, and instead visited virtually using Zoom. Observations were audio recorded. Of the 12 educators interviewed, one teacher and one ECE had been assigned to online instruction roles due to COVID for that school term, one teacher was assigned to an administrative role, and one ECE chose not to participate in observations because she was reassigned with a teacher who was not comfortable with the observation due to conditions of the pandemic. Therefore, observations were not completed for each of these educators. I observed each of the remaining eight educators (four teachers and four ECEs) for two to three hours per classroom (dependent on classroom schedules and transitions). At each visit, I video-recorded

the classroom's physical environment when there were no children present and excluded any child-identifying information (e.g., name tags on walls) which allowed me to enhance my observations of the physical environment as per my observation checklist. During each observation, I collected data using the Self-Reg Classroom Environment and Implementation Checklist (SCEIC; see Appendix C).

During classroom observations, I used one checklist for the teacher, and one for the ECE. The classroom audio was recorded using a Zoom-enabled device placed in an unobtrusive location in the classroom in order to record the educators' interactions with students. The audio recording enabled accurate transcription and potentially reduced biased interpretation by the researcher.

3.8.4.1. Development and Pilot of the Self-Reg Classroom Environment and Implementation Checklist (SCEIC). I designed the SCEIC to allow for the initial quantification of educator facilitation of the self-regulation processes in the classroom (physical environment, educator facilitation, and relationships). To do so, I reviewed the following Ontario pedagogical resources to determine which recommendations are made for the facilitation of self-regulation in Ontario kindergarten classrooms:

EduGAINS: The Four Frames (EduGAINS Kindergarten Home, 2017)

Kindergarten Matters: Intentional Play-based Learning; It's About Self-Regulation (Kindergarten Matters: Intentional Play-Based Learning, 2017)

How Does Learning Happen? (Government of Ontario, 2014)

The *Kindergarten Program* (Ontario Ministry of Education, 2016b)

Class Environment Reflection Tool. (Shanker, 2012)

When a strategy or example was indicated in each document, I added it to a master list of expected educator behaviours/practices. Further, many items from the Class Environment Reflection Tool were included on the checklist as well to observe the classroom environment. The Classroom Environment Reflection (CERT) tool is designed to help educators self-reflect upon the *design* of their classroom environment. It includes a list of stressors in each of the domains (visual clutter, lighting, noise, hydration and nutrition, seating options, smells, microenvironments, and teaching students about stressors) and lists examples of these in a checklist format (e.g., reducing visual clutter as a stressor includes the examples of clearing surfaces, organizing walls and bulletin boards, and the use of study carrels). These examples were integrated into the SCEIC classroom observation tool.

The master list of items was then consolidated with similar items grouped together for ease of use. Items consistent with the Ontario Ministry of Education's mandated means of facilitating self-regulation in the classroom were included as Column A on the checklist. I then examined each item and added a corresponding behaviour to the checklist in the adjacent column (B) with behaviours that were consistent with alternative frameworks (e.g., teaching self-regulation to the entire class rather than working on the process individually with each student). For each column, A and B, I added a column indicating whether the item was observed (√) and another column for each row to indicate an observed example of the item. The observed behaviours for both columns A and B were then totalled.

To further develop and refine the tool, one educator who had expressed interest in participating in the study was contacted in order to pilot the use of the tool and the observation method. With consent of the principal and educators in the kindergarten classroom, I visited and collected data using the procedure and tool outlined above. Field notes were used to then go back

to the SCEIC and revise some items to increase their clarity and increase objective use of language. I then sought feedback through discussion with my doctoral supervisors to further refine the SCEIC. It was found that some items were worded in such a way that column A on the tool appeared to be the "right" way to facilitate self-regulation, and column B the "wrong" way. For example, item 9 was previously worded, "individualized strategies are not used; strategies are taught via program or lesson to the whole class", but the first portion about individual strategies not being used was removed since it was negative, redundant, and potentially judgmental. In some items, wording was adjusted to minimize the use of passive voice and create items using an active voice. The wording for items 15, 14, 22, and 26 was changed to make them more objectively observable. Item 14 in particular was reworded to avoid the term "unwanted behaviour" as this specifies a behavioural approach as opposed to seeing the behaviour as a stress behaviour or as dysregulation. There was no specific feedback provided by the classroom staff due to time restraints. I extended an invitation to provide later feedback via telephone or email, but no further feedback was provided. The revised tool was then submitted and approved for use by the REB (see Appendix C).

Concurrent with the Observation Checklist, handwritten field notes were collected during each visit to provide a richness of data to cross-reference with the Observation Checklist. Examples of what was seen for each educator behaviour were recorded as well as other relevant contextual information (e.g., transitions). Interactions with students were confidential and data collection excluded identifying information. Additionally, the focus was on educator behaviours versus children's responses. The goal was to capture as many of the educator dispositions relevant to self-regulation as possible throughout the observation.

3.9. Data Analysis and Coding Procedure for Open-Ended Survey Questions, Interviews, and Communications of Learning

I began with a pre-determined set of codes with which to analyze my data but due to the nature of the data, I abandoned this pre-determined list because I wanted to examine without pre-judgement the definitions of self-regulation that educators were using to guide their understanding and practice. I therefore began inductively coding using an open, in vivo process whereby I read each line of text, highlighted each piece of information indicated by the educator and named it based on what was said (Friese, 2019), which resulted in over 700 emerging codes across surveys and interviews. Next, I reviewed the codes created and merged those that said the same thing in different words, renaming the code to represent both quotations if needed, which resulted in 150 codes. I grouped these codes into categories to begin identifying patterns, including the code groups shown in Table 4.

Table 4

Codes and Code Groups Emerging from Surveys and Interviews

Code Group	Codes Included in Code Group
The educator's definition of self-regulation (11 codes)	definition - ability to adjust well to change definition - applying strategies definition - balance definition - biophysiological - regulating basic needs - washroom, hunger, thirst definition - following social expectations to deal with emotions definition - independent definition - making reasoned / logical / safe / informed decisions definition - pursuing long terms goals for self definition - self control feelings, thoughts, behaviour definition - self-awareness definition - stress response
The educator's description of a well-regulated student (11 codes)	well-regulated - basic daily living well-regulated - good model for others well-regulated - happy, smile, safe, comfortable

Code Group	Codes Included in Code Group
	well-regulated - adapts to change
	well-regulated – executive function skills
	well-regulated - independent choices
	well-regulated - learning
	well-regulated – self-control
	well-regulated – socio-emotional learning
	well-regulated – Shanker self-reg
	well-regulated - transitions well
The educator's description of a poorly regulated student (13 codes)	poorly regulated - don't care
	poorly regulated - predicted diagnosis
	poorly regulated - always moving
	poorly regulated - arousal
	poorly regulated - biophysiological
	poorly regulated - behaviour
	poorly regulated - communication
	poorly regulated – having difficulties
	poorly regulated – executive function
	poorly regulated - emotions
	poorly regulated – mental health
	poorly regulated - needs
	poorly regulated – socio-emotional learning
The educator's plan or process for including self-regulation throughout the school day (6 codes)	plan/process - calm down after recess
	plan/process - have tools available (i.e. headsets)
	plan/process –programs
	plan/process - religion
	plan/process - time per day - 30-35 minutes at end of day
	plan/process - trial and error throughout the day
The educator's facilitation of self-regulation in the classroom (28 codes)	fac - accept and acknowledge
	fac - advance warning
	fac - affect high
	fac - affect low
	fac - ask why
	fac - behaviour
	fac - democracy
	fac - discuss feelings
	fac - environment
	fac - give choices
	fac - independence
	fac - materials
	fac - modelling, think aloud
	fac - pacing
	fac - paraphrasing
	fac - problem solving
	fac - programs
	fac - relationships

Code Group	Codes Included in Code Group
	fac - religion-based
	fac - respond and redirect
	fac - responsibility
	fac – socio-emotional learning
	fac – Shanker Self-Reg
	fac - strategies
	fac - structure unstructured time - unfocused
	fac - teach with centers
	fac - teacher-directed lesson - children dysregulated
	fac - teacher-directed lesson children engaged
How (and if) self-regulation is facilitated online (5 codes)	online - challenges for kindergarten
	online - documentation
	online - literacy and math and science focus
	online - self-reg facilitation and activities
	online- teacher's union advised against live connecting
How the educator documents self-regulation (for reporting purposes; 8 codes)	documentation - ABC data chart
	documentation - anecdotal notes
	documentation - checklist
	documentation - common lines from curriculum
	documentation - journals for those having SR difficulty - what works or not
	documentation - online - teachers instructed not to comment on anything since March 13 on June CoL
	documentation - photos and videos
	documentation - teacher and ECE don't talk about self-regulation. Most report card discussions are about math and literacy
The needs and barriers of facilitating self-regulation in the classroom (12 codes)	barrier - having to teach basic skills (i.e. self-reg) before academic
	barrier - class size
	barrier - having too many programs / lessons
	barrier - home and school consistency
	barrier - incidence reports with no feedback on them - doing them for nothing
	barrier – educator’s own emotions
	needs - more regular outside professional support
	needs - more staff
	needs - more team time / support / cohesion (CPLC and release time)
	needs - more training / resources
	needs - quick and easy way to document
	needs - things (supplies / funding)

Within these code groups, themes began to emerge including the common use of definitions and descriptions of self-control and learning strategies. To build bridges between educator definitions and the preliminary research done in my literature review, I created a second set of code groups to separate educators' definitions into the definitional categories described by Burman (2016). First, because the descriptions of well-regulated and poorly regulated students had a great deal of overlap with definitions of self-regulation, these groups were combined. Next, I went through each code and assigned it to one of Burman's categories in a code group by that name. To do so, I contacted Jeremy Burman, author of the seminal work on the definitions of self-regulation found in the literature, for a list of the 88 controlled terms his definitions had been narrowed down to and the cluster (category) that each belonged to, based on his analysis (J. T. Burman, personal communication, July 30, 2020). I then read through each code and scanned the quotations in my data, determined which cluster it belonged to by finding the controlled term it corresponded to in Burman's provided data, and added it to one of the code groups as follows (in no particular order):

B1: Learning Strategies

B2: Agency, self-determination, internal and external locus of control, helplessness

B3: Social Behaviour

B4: Self-monitoring (personality)

B5: Self-management (self-evaluation, behaviour modification, cognition)

B6: Self-control

In addition, I added a seventh group to represent the area where these definitions converge, per Burman (2016), which is the Ministry-adopted, original, neurophysiological definition of self-regulation:

B7: the body's ability to respond to and recover from stressors and to recover from the energy expended in managing stressors.

I then repeated this process for each code within the facilitation code group, assigning each to a Burman category to examine how educators were facilitating self-regulation within their classrooms. I analyzed the survey, interview, and Communication of Learning data separately and then examined them overall for similarities and differences. Finally, I included an additional chapter (Chapter Five) in order to more deeply examine some of the emerging themes within the context of two classrooms—one which adopted the greatest number of Ministry recommendations, and one which adopted the fewest, and the differences between the two classrooms in terms of student engagement.

3.10 Data Analysis and Coding Procedure for Classroom Observations

Examples from classroom observations were entered into Atlas.ti and coded in the same way the survey data was coded. Field notes were used to supplement examples in data analysis. Initial free coding with code groups formed to represent Burman's (2016) six categories plus the Ministry-adopted neurophysiological definition.

3.11. Validity, Reliability, Credibility, and Trustworthiness

To enhance qualitative and quantitative validity and reliability, the following steps were taken:

1) Relevant Ontario pedagogical documents and existing research from the field (Ministry of Education and the MEHRIT Centre) were used to development the SCEIC observation checklist; primarily the *Kindergarten Program* (Ministry of Education, 2016) as well as Classroom Environment Reflection Tool (Shanker, 2012; see Appendix J).

2) The SCEIC was piloted in one preliminary classroom observation to ensure effectiveness of the instrument and its practical use. It was found to work effectively in practice, and several adjustments to wording, described in section 3.9.4, were made.
3) Data was triangulated across several individuals in different classroom roles (the benefit being that triangulation builds evidence for emerging codes; Creswell & Plano Clark, 2018). I surveyed twenty nine educators. I then interviewed twelve of these educators (six teachers and six ECE's) and collected their Communications of Learning. Finally, I observed eight these educators (due to attrition) in the classroom. This provided information on 8 educators across four data points: surveys, interviews, Communications of Learning, and classroom observations.
4) Multiple instruments were used to gather data. Data was analyzed by cross-referencing findings from the SCEIC, observation field notes, educator interviews, and Communications of Learning data across four educators (2 teachers and 2 ECEs) to search for commonalities between educators' reported perceptions of their practice and their practices as observed. By using a variety of sources, my study did not rely on just one source of information, but instead cross-referenced educators beliefs with observed practices.
5) Qualitative coding was completed with initial guidance from the researcher's doctoral supervisor to enhance objectivity to increase integrity through guidance and support from experienced qualitative researchers.
6) Coding methods were described in sufficient detail to allow for scrutiny (see Section 3.9 as well as Appendix H for further details.)

7) Participants were provided with interview transcripts for review and potential corrections and reflections prior to coding the data to ensure accuracy.
8) Any disconfirming evidence was reported in the results and acknowledged in the discussion.

3.12. Limitations

The study was limited since there were no previous studies within the kindergarten research that pointed to the neurophysiological definition of self-regulation as described in this study. The framework selected for use in this dissertation was based on reviewing the types of definitions used in the literature (as per Burman, 2016), the trends in the dominant research paradigms over time (Post, 2006), and their relationship to the kindergarten self-regulation literature. These definitions and research trends point towards a need to reframe the kindergarten research from a neurophysiological perspective, rather than expanding on existing methods that are more limited in scope. Although research in kindergarten contexts using the original neurophysiological definition of self-regulation was not found, I hope that this study prompts other researchers to consider the definitions of self-regulation being used, to clarify their definitions accordingly (or if it is really self-control being studied, to indicate this clearly), and to align their methodologies with the indicated definition. The research in neurophysiological self-regulation needs to bridge research in kindergarten and early years education, as these two fields do not align very well. Further limitations will be discussed in Chapter 6, including limitations regarding data collection tools.

3.13. Ethical Considerations

This study complied with all ethical procedures outlined by Lakehead University as well as the ethical protocols of the school board. Ethical procedures were indicated in the descriptions

of the data collection procedures above, and all consent letters describing informed consent, confidentiality, data storage, and relevant ethical concerns are detailed in the Principal, Participant (Educator), and Parent Letters in Appendices E, F, and G, respectively.

Chapter 4: Results

In this chapter, I highlight the results of surveys (descriptive demographics and qualitative data) and overall results from follow-up interviews and Communications of Learning (qualitative data). I then compare and contrast these results with what I observed educators doing in the classroom using the SCEIC (Self-Regulation Classroom Environment and Implementation Checklist; quantitative scores and qualitative examples, and field notes). To demonstrate educator focus on overall definitions and facilitation styles, I have initially used percentages of overall comments made because the majority of educators were in agreement about definitions and facilitation styles used. There was more detail and differentiation among educators as data collection progressed, so I also refer to the number of educators reporting each theme.

4.1. Survey Results

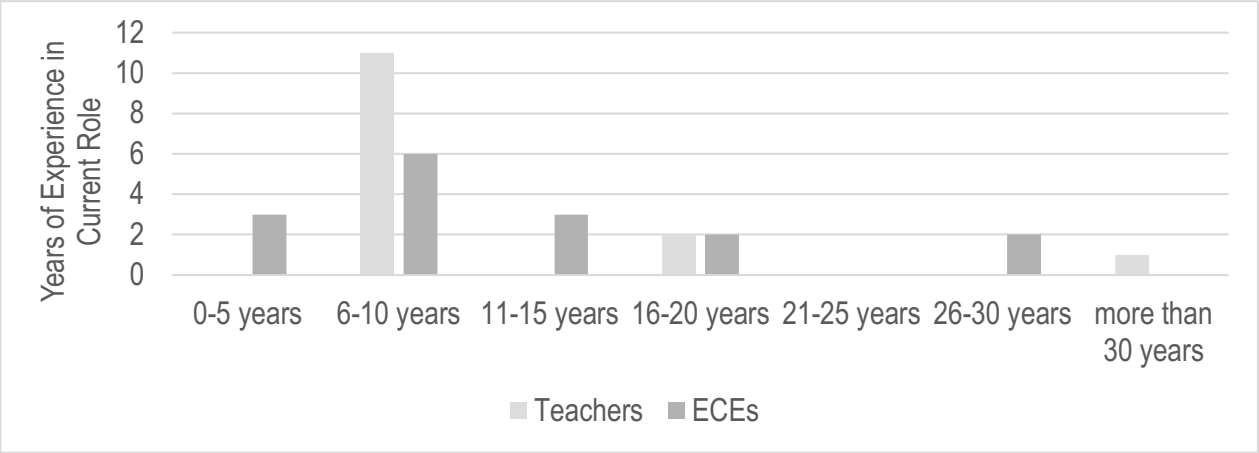
The survey sample consisted of 29 educators (15 teachers and 14 ECEs).

4.1.1 Demographics, Professional Development, Knowledge of Resources

Educators completed demographic questions in their surveys. Teachers had an average of 11.4 years of experience in their roles and ECEs had a similar average of 11.9 years of experience. Most educators (18 of the 29 teachers and ECEs) are in the earlier stages of their career, falling within the 6-10 years of experience range (Figure 6).

Figure 6

Years of Experience in Current Role for Teachers as Reported In Surveys

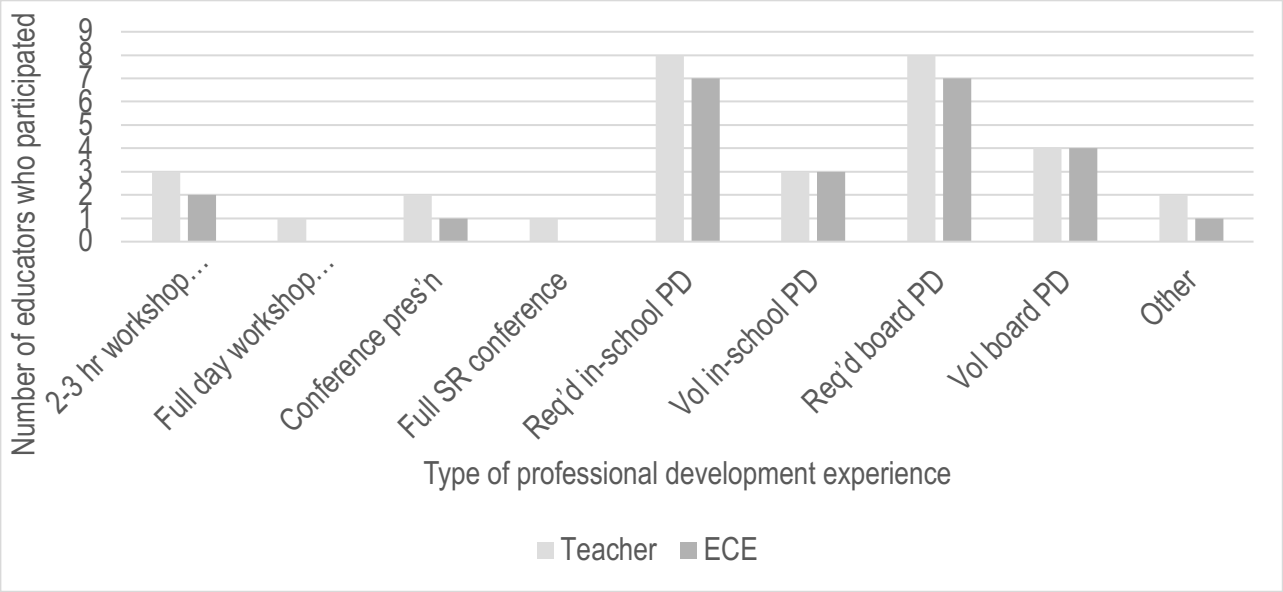


Note. n=15 teachers and n=14 ECEs

Educators' professional development in self-regulation was mostly comprised of mandated in-school and board-wide professional development opportunities. The specifics of this training were revealed during the interviews (i.e., *Al's Pals* and *Zones of Regulation* training). There was little participation in outside professional development. Most of the training offered by the school board did not differentiate the training provided to teachers versus ECEs. Of the 29 educators, 8 teachers and 7 ECEs (52% of participants) had participated in required in-school and board professional development on self-regulation (Figure 7).

Figure 7

Educator Self-identified Professional Development Activities



Note. n=15 teachers and n=14 ECEs

Educators were asked to indicate their familiarity with several key educational documents that include content on self-regulation (see Table 5). Some of these documents are provided to educators by the Ministry of Education and school board and some are referenced or recommended within these Ministry resources. Others are educational resources that emerged from my literature review as resources purported to address self-regulation. Educators rated their familiarity with each resource on a scale of 1 to 5, where 1 represented having never heard of the resource and 5 represented being very familiar with it (Table 5).

Table 5

Educator Familiarity with Resources

	Never heard of	Heard of but unfamiliar	Some-what familiar	Quite familiar	Very familiar
Ontario Ministry of Education Documentation					
The *Kindergarten Program*	0	0	3	5	17
Growing Success – The K Addendum	0	2	4	9	10
Edugains	9	5	7	4	3
Self-regulation resources aligned with the *Kindergarten Program*					
Self-Reg (Shanker)	13	10	2	3	1
CAL (Shanker)	17	8	3	0	1
Well Aware (Tranter)	26	2	1	0	0
Explosive Child (Greene)	16	6	3	1	1
Social and Emotional Development (Delahooke)	17	5	6	0	1
Beyond Behaviors (Delahooke)	23	3	3	0	0
Alert Program (Engine; Williams and Shellenberger)	6	4	6	8	3
Commonly used self-regulation program					
Zones (Kuypers)	3	2	9	6	7
Documents underlying the *Kindergarten Program*					
EYS1	24	3	1	1	0
EYS2	15	8	3	2	1
EYS3	18	3	4	4	0
ELECT	10	4	7	5	4
FDK Moving Ontario Forward	4	6	5	9	6

Note. n=29

This data shows that 25 of the 29 educators surveyed were familiar with Ontario's *Kindergarten Program* (17 of these 29 were *very* familiar with the program). In contrast, educators were less familiar with educator self-regulation resources which align with Ontario's

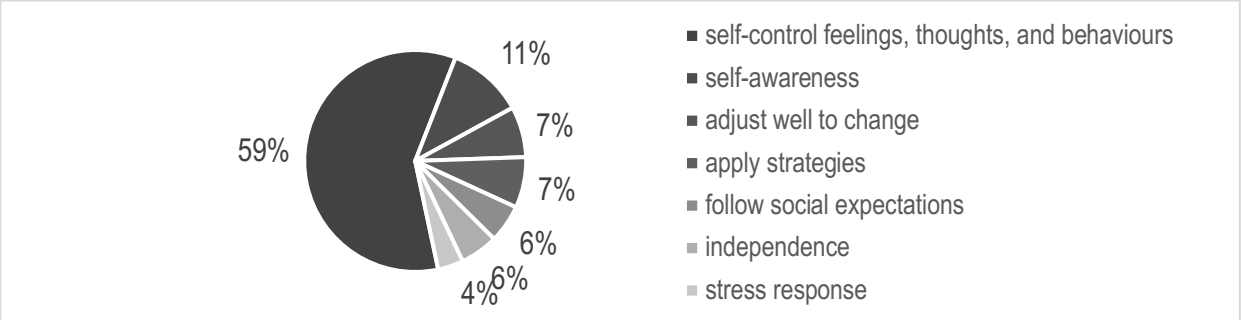
self-regulation framework. For example, 13 of 29 reported having never heard of Shanker's (2016) *Self-Reg*, and 17 of 29 reported never having heard of Shanker's (2013) *Calm, Alert, and Learning.* Sixteen had never heard of Ross Greene's work on *The Explosive Child* (Greene, 2007*)*. In addition, 26 had never heard of Tranter's (2018) *Third Path*, 17 and 23 had never heard of Mona Delahooke's books, *Social and Emotional Development* and *Beyond Behaviours* (Delahooke, 2017, 2019). There was some familiarity with Williams and Shellenberger's (1996) *The Alert Program,* (17 were somewhat, quite, or very familiar), but 10 had either not heard of it or knew nothing about it). Kindergarten educators were familiar with the *Kindergarten Program* (Ontario Ministry of Education, 2016b) but not the self-regulation resources cited within it.

4.1.2. Definition

In the survey, educators defined self-regulation using the open-ended question, "What does self-regulation mean?" and I coded the responses from the 29 educators through in vivo (free) coding for themes. From this process, 57 relevant definitions emerged, with the top seven shown in Figure 8.

Figure 8

How Educators Define Self-Regulation



Note. The top seven of 57 emerging themes are presented here, with the percent of overall comments indicated.

This initial phase of coding showed that 59% of comments within definitions emerging from the surveys referred to self-control of feelings, thoughts, or behaviours, with some educator responses including comments relevant to multiple definitions. For example, several participants described self-regulation as a person's ability to control their own actions, emotions, and behaviours in alignment with social expectations and to avoid being out of control. Sofia (all names used are pseudonyms) described self-regulation as being able to "adjust [one's] behaviour to fit the situation." Bev mentioned that self-regulation means to "control your actions", and Zoe indicated that self-regulation means to "regulate one's own behaviours". After self-control, the second most common theme was self-awareness (with 11% of definition responses emerging from the survey). Here, participants described the ability to recognize one's emotions, to explain to others which emotion they are feeling, to be self-aware enough to know when one's emotions are starting to take over in detrimental ways, and to know how one is feeling in the moment. Adjusting well to change and applying self-regulation strategies were also represented in the responses, although targeted changes or strategies were not referenced. Another emergent theme was the use of socially appropriate ways to deal with one's emotions, although participants did not describe what the social expectations were. Ophelia suggested the example of "independently following instructions and following expectations", and another mentioned that self-regulation means responding in a way the world expects you to respond. I had the opportunity to explore these ideas further in the interview phase of my study described below, but overall, this initial coding phase revealed that the majority of kindergarten educators define self-regulation using a self-control framework.

To further understand this data and contextualize it within the definitional categories described earlier (Burman, 2016), I then organized these 57 codes into code groups based on

Burman's 6 categories of self-regulation interpretations. Whereas Burman's study examined self-regulation across a variety of contexts, the current study focused in on just the kindergarten literature to examine which categories of definitions kindergarten educators used. As noted in Chapter 2, Burman's categories are as follows:

1. Self-regulated learning (i.e., trial and error learning, metacognitive strategies, and time spent on task)
2. Agency / Self-Determination / Internal External Locus of Control / Helplessness (i.e., volition, interpersonal control, self-determination, and independence)
3. Social Behaviour: (i.e., social behaviours regulated by the individual)
4. Self-monitoring (Personality; including self-perception, personality traits, reflectiveness: (i.e., self-perception, self-esteem, reflectiveness, perfectionism)
5. Self-management (i.e., cognitive techniques, self-instructional training, cognitive, and behaviour modification)
6. Self-Control (including emotional regulation and emotional control): (i.e., inhibition of impulses, emotional adjustment, behavioural inhibition)

A seventh category, representing the original neurophysiological definition of self-regulation which overlaps at the centre of all these interpretations, was also included, since this is the definition (and framework) that the Ministry has asked kindergarten educators to embody in their classrooms.

7. Neurophysiological (Stress response; Ministry-adopted definition)

Furthermore, there were overlaps in the ways that educators defined self-regulation and the ways they described their well-regulated and their poorly regulated students in this round of

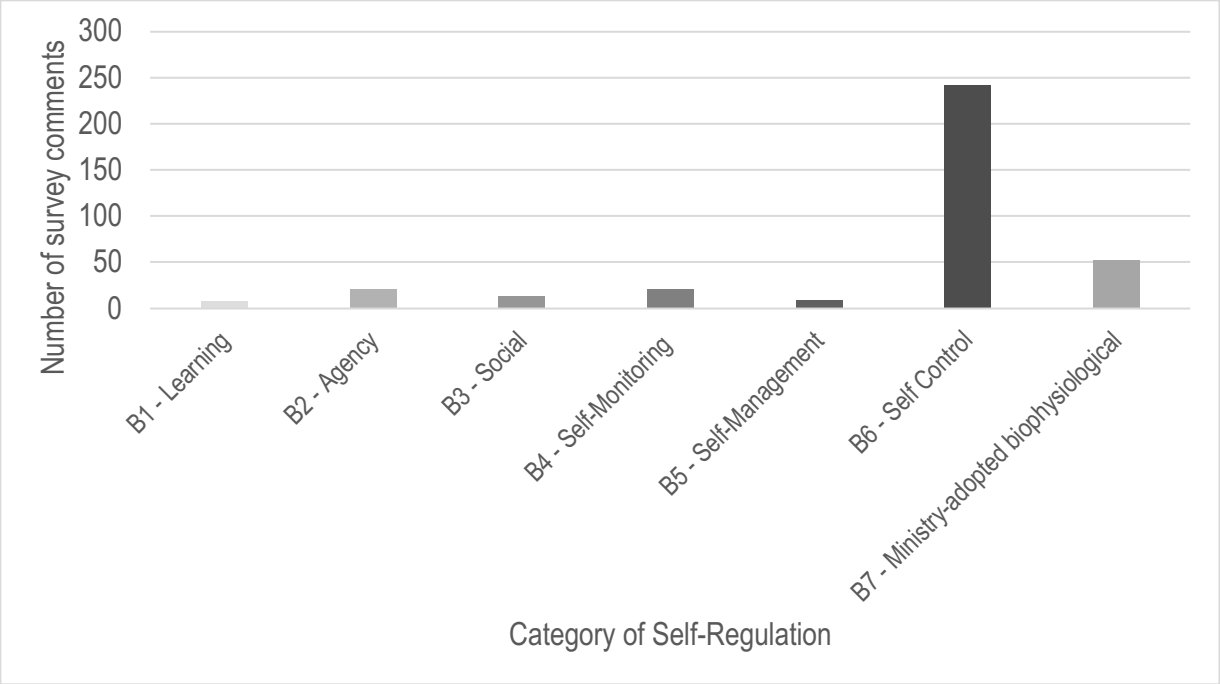
coding. Therefore, it made sense to merge the responses to three questions in this round of data analysis:

> What does self-regulation mean?
>
> Describe one of your well-regulated students. How do you know they are well-regulated?
>
> Describe one of your poorly regulated students. How do you know they are poorly regulated?

This new analysis revealed similar findings to the original process of free coding, that educators primarily see self-regulation through a self-control lens, defining self-regulation *as* self-control. From this analysis of 368 relevant responses, 8 responses represented the self-regulated learning category, 9 self-management, 14 social, 21 agency, 21 self-monitoring, 53 related to the Ministry-adopted, original neurophysiological definition, and 242 represented self-control. These results are summarized in Figure 9.

Figure 9

Number of Overall Survey Responses to Questions 5-7



Note. n=368 responses

A few responses (53 of 368, or 14%) indicated some educator understanding of the Ministry-adopted framework of self-regulation. When educators discussed self-regulation in Ministry terms, they referred to distress, agitation, difficulty breathing, identification and communication of feelings with others, family life and other potential stressors, biological needs (e.g. hygiene, hydration), and physical observations (e.g. posture, visibly upset). For example, Eden described one child as follows:

> The child then goes to Al's Place [a small chair in the room where children can go to take a break], talks to me after they are ready, expresses how they were upset, and asks me to go with them to talk to a friend. The child then expresses their feelings to their friend and their friend expresses their feelings back.

Although she was referencing a child she described as needing to calm down, she indicated understanding of the need for a break before being ready to talk.

However, the majority of the definitions and descriptions provided by the educators in this study (242/368, or 66% of responses) were based on seeing self-regulation through a self-control lens. Educators using self-control terminology referred to things like adjusting one's behaviour to be socially appropriate, controlling one's emotions and frustrations, listening to adults trying to reason with you, completing work, being attentive and focused on schoolwork, staying in one spot, following expectations, and the absence of aggressive behaviours like hitting, kicking, screaming, crying, interrupting, or talking out. For example, Eden stated that one child "says no and then once we try to move closer to the child, the child will run away screaming very loudly saying no or just crying". Sofia mentioned that self-regulation is "the ability to control and manage your feelings and emotions", describing a well-regulated student as one who "can control their frustrations and problem solve. They are able to use appropriate and acceptable words. They do not hit, run, or scream". She described a poorly regulated student as one who "is not able to control emotions and feelings" and who "does not understand consequences".

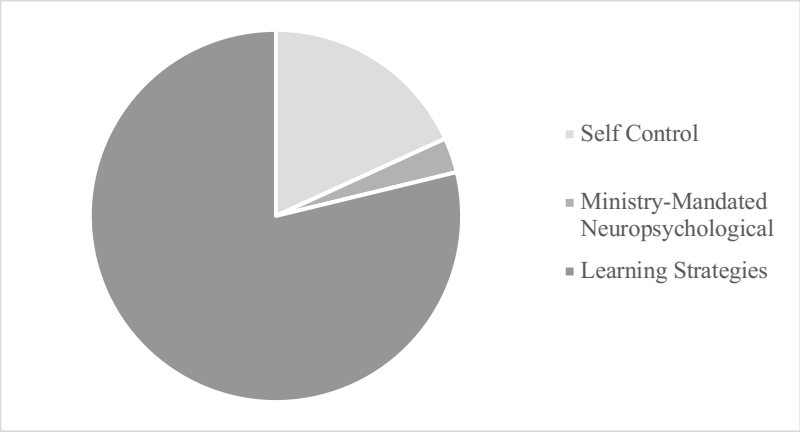
4.1.3. Facilitation

In my survey, I asked educators, "How do you facilitate self-regulation in your classroom?" Despite the educators' unanimous adoption of a self-control definition (the majority of each educator's responses fit under the self-control category), only one educator referenced a self-control facilitation style (this will be further explored in the discussion), four educators referenced both self-control and learning strategies equally, and 22 of the 29 (76%) of educators

surveyed indicated that they primarily used learning strategies to address self-regulation in their classrooms (see Figure 10).

Figure 10

Educators' Self-Regulation Facilitation Approaches



Note. n=29 educators. Educators who referenced both self-control and self-regulated learning equally were counted in both categories here.

Those educators who indicated a learning strategies approach (n=26, or 90%) referenced the themes indicated in Table 6, with entire individual responses sometimes referencing more than one of these themes.

Table 6

Themes Indicated by Educators Using a Learning Strategies Approach

Theme	Number of Educators Referencing Theme
Educators need to use reminders and redirection to help students stay focused on their work	1
Educators use visuals (charts and incentive charts / token systems, stop signs and red/yellow/green signs to manage and prompt appropriate behaviour during group learning)	11
Educators use tools such as fidget toys to help students sit still on the floor during group instruction	8
Educators prompt self-regulation strategies	4
Educators encourage students to try again	1
Educators use short and clear directions	1

Educators create structure and routine that children learn to follow predictably	6
Educators model strategies throughout the day	9

4.2. Interviews

Interviews were arranged with 12 educators from six different classrooms (six teachers and six ECEs interviewed separately), each of whom agreed on their surveys to participate in further research (Table 7).

Table 7

Pseudonyms of Educators (Teacher and ECE Pairs) that were Interviewed

Classroom	Role	Pseudonym	Years of Experience
1a	Teacher	Bev	8
	ECE	Ava	8
1b	Teacher	Fay	6
	ECE	Eve	8
2	Teacher	Lily	6
	ECE	Eden	9
3	Teacher	Sofia	8
	ECE	Eliza	10
4	Teacher	Claire	8
	ECE	Amelie	8
5	Teacher	Rosalie	7
	ECE	Ophelia	6

Note. Classrooms 1a and 1b represent two separate classrooms within the same school.

In the interviews, I had the opportunity to more deeply analyze educators' understanding and facilitation of self-regulation in their classrooms. I asked questions about their theories and beliefs, planning of teaching and assessment, and professional development experience (Figure 11). Their responses are described within these respective sections below. Quotations are included where relevant, and these findings are more deeply expanded upon in Chapter Five which presents case studies of two classrooms in more detail.

Figure 11

Interview Questions

THEORIES AND BELIEFS

1. How do you define self-regulation? (was asked in survey, but will be asked again for triangulation / reliability)
2. What does it mean to be a well-regulated person?
3. What is your role as an educator in the development of your students' self-regulation?
4. What is the role of the student in your students' self-regulation?
5. What is the role of the family in your students' self-regulation?
6. You described an example of a well-regulated student in your survey (read response out loud). Is there anything you would like to add to this?
7. You described an example of a poorly-regulated student in your survey (read response out loud). Is there anything you would want to add to this?

PLANNING OF TEACHING AND ASSESSMENT

1. Do you have a plan or process for including self-regulation in your classroom? (i.e. lessons, activities)
2. Do you set time aside in your day for specifically teaching self-regulation? How much time, and how do you teach SR?
3. How do you *document* self-regulation in your classroom from day to day? (for example: team discussions, focus on process or outcomes, focus on standardized procedures, reflective practice, assessment for/as/of learning)
4. How do you *assess* self-regulation in your classroom for reporting purposes? (for example: team discussions, focus on process or outcomes, focus on standardized procedures, reflective practice, assessment for/as/of learning)

PROFESSIONAL DEVELOPMENT

5. Describe your professional development experiences – what was helpful and what was not in learning about self-regulation?
6. What relevant support do you receive as an educator in learning about how to facilitate self-regulation?
7. Have you encountered any barriers in facilitating self-regulation in your practice? If yes, describe.
8. Look at the Self-Reg Rubric (see Appendix I). Where do you feel you are at in terms of your understanding and embodiment of self-reg in each step? (interviewer to circle appropriate area for each interviewee)
9. Have you shared your experiences and knowledge of SR with those who don't have as much knowledge or experience? With whom? How?
10. What would help you to enhance your practice?

4.2.1. Theories and beliefs

Definition and Description. Educators were asked, "How do you define self-regulation?" Similar to my process for analyzing interviews, because of the overlap in responses among the following questions (many were providing responses to one question within their response to another and vice versa), I merged the responses from these four questions together in the coding process to describe how educators define and describe self-regulation:

1. How do you define self-regulation?

2. What does it mean to be a well-regulated person?

6. You described an example of a well-regulated student in your survey. Is there anything you would like to add to this?

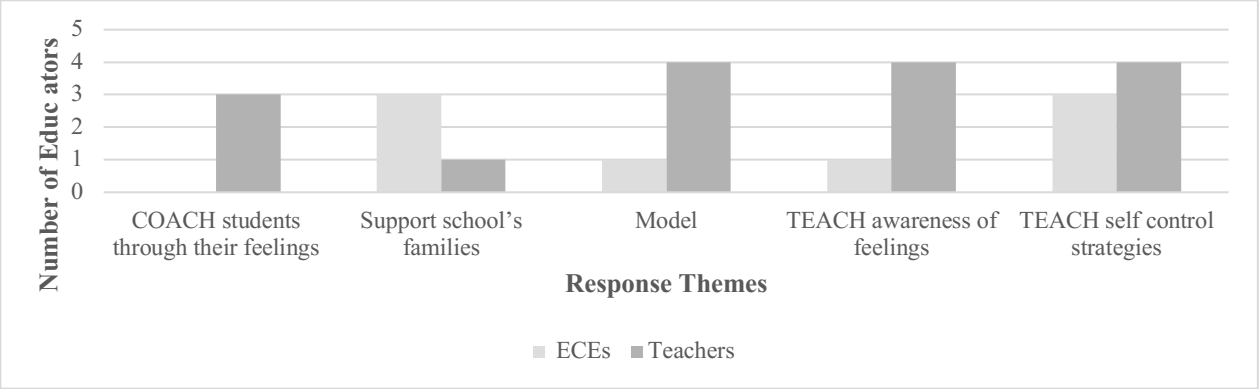
7. You described an example of a poorly regulated student in your survey. Is there anything you would like to add to this?

Overall (when all 193 responses to these four questions were analyzed collectively), the educators interviewed referred to self-control 61% of the time when defining and describing self-regulation. In contrast, they referred to the Ministry definition (neurophysiological) 21% of the time and to learning strategies 2% of the time. Interview results were similar to the survey results. For example, Ophelia described self-regulation as "the ability to know how to control your body" and "to know how to calm yourself down", and Fay indicated that self-regulation is the "ability to manage what's happening inside and showing a socially acceptable outside". *All* educators described a primarily self-control definition of self-regulation, a theme which will be explored more deeply in Chapter 5.

Role of the educator. To expand on their theories and beliefs about self-regulation, I asked educators to "describe the role of the educator in the development of students' self-regulation". Several themes emerged from their responses, including being responsible for teaching self-regulation strategies, teaching awareness of feelings, modelling self-regulation, and coaching the use of taught strategies (Figure 12).

Figure 12

What Educators View as the Educator's Role in Supporting Their Students' Self-Regulation



The most common theme that emerged was that the educator's role was being responsible for teaching self-control strategies (4 teachers and 3 ECEs). For example, Ava mentioned that she would "try to get them to identify what the triggers are so that they can learn that when that trigger happens, this is what I need to do, and give them those skills." Educators also saw their role as teaching awareness of feelings (4 teachers and 1 ECE). For example, the following exchange during the interview shows how Claire teaches students how to recognize feelings by using pictures:

> Claire: I think we need to start developing their idea of feelings and knowing how to recognize those feelings and recognize them within themselves and that everybody has feelings. And then, of course, developing strategies that they can use when they are feeling sad or happy or excited or mad.
>
> Researcher: So how do you teach and develop those strategies? What are some examples of how you would teach that?
>
> Claire: In Kindergarten, we have *Al's Pals*. I've also done the *Zones of Regulation*…You start off with pictures of faces and what is this person feelings and how do you know and what about their face is showing you? So, it's not just like someone has a smile, but it's

> their eyes that are also feeling happy and looking happy and it's the brow and things like that. So, getting them to identify what someone is feeling and why they might be feeling that.

Claire was focused on teaching students how to recognize feelings of others by looking at specific facial features in a very cognitively based way.

Another emerging theme was that educators saw their role as modelling self-regulation (four teachers and one ECE). Eve mentioned teaching students how to respond to problems by modelling what to do as her top priority:

> I think the number one role of an educator is to model self-regulation. I think it's modeling. You know, like if something goes wrong, just handling it in a proper manner. I mean, proper as in there are different ways to handle it. But if something goes wrong, if I get upset easily when something goes wrong, then my students are going to think that that's how we do it.

Eve tried to teach her students how to self-regulate by modelling what she thought they should do when something unexpected happens.

Beyond these three themes, three ECEs and one teacher suggested supporting families and three teachers mentioned coaching students through their feelings. Hannah mentioned that this means "guiding them through their feelings" and "being a physical support in terms of their emotions". Other themes that were less represented included teaching students that feelings are ok, listening to students, being with students as a team, managing red flags and diagnostic plans, and making children accountable for their actions. This theme will be expanded through case studies in Chapter 5.

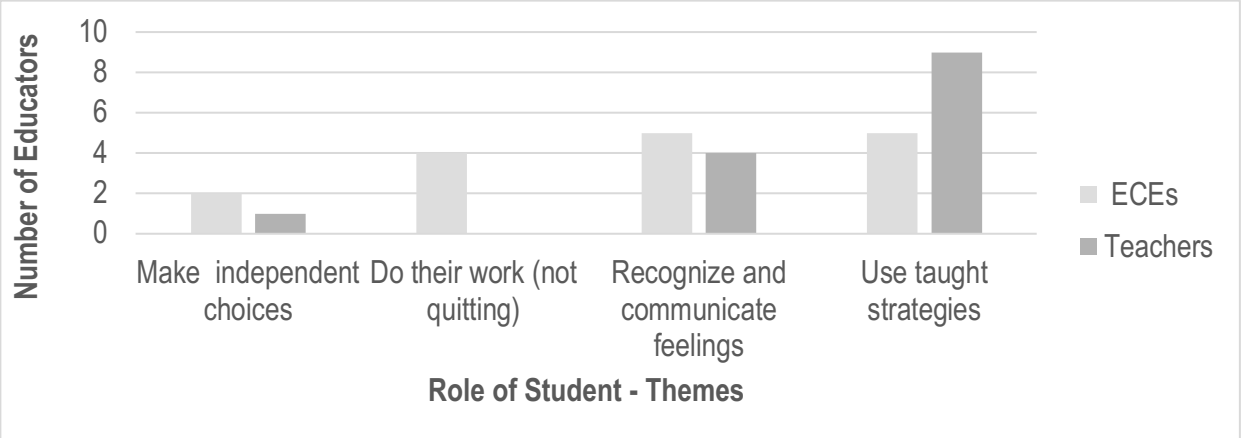
Role of the student. When asked, "What is the role of the student in developing their own self-regulation skills," nine teachers and five ECEs indicated that the student's role is to use targeted/taught strategies (Figure 13). In fact, comments about using the taught strategies represented 39% (14 of 36 total responses to this question) of all responses across educators. For example, Hannah mentioned that "in *Al's Pals*, that we do in our class, they're listening and then putting those strategies into practice. Using the visuals that we have up in the classroom — they [should] refer to those to help them." Eliza expanded on this idea by describing how she teaches the *Al's Pals* lessons each day so that once all the lessons were delivered, students would do the things they were taught:

> …then we can use it more and say, "Hey, remember when Al taught us how to recognize, or stop and think?" So, if we could do that, then more of the kids would understand and remember for the most part, so that's something I use.

Hannah's response demonstrates her belief that students can cognitively control their behavioural responses (stress behaviours) in kindergarten.

Figure 13

What Educators See as the Role of the Student in Developing Self-Regulation



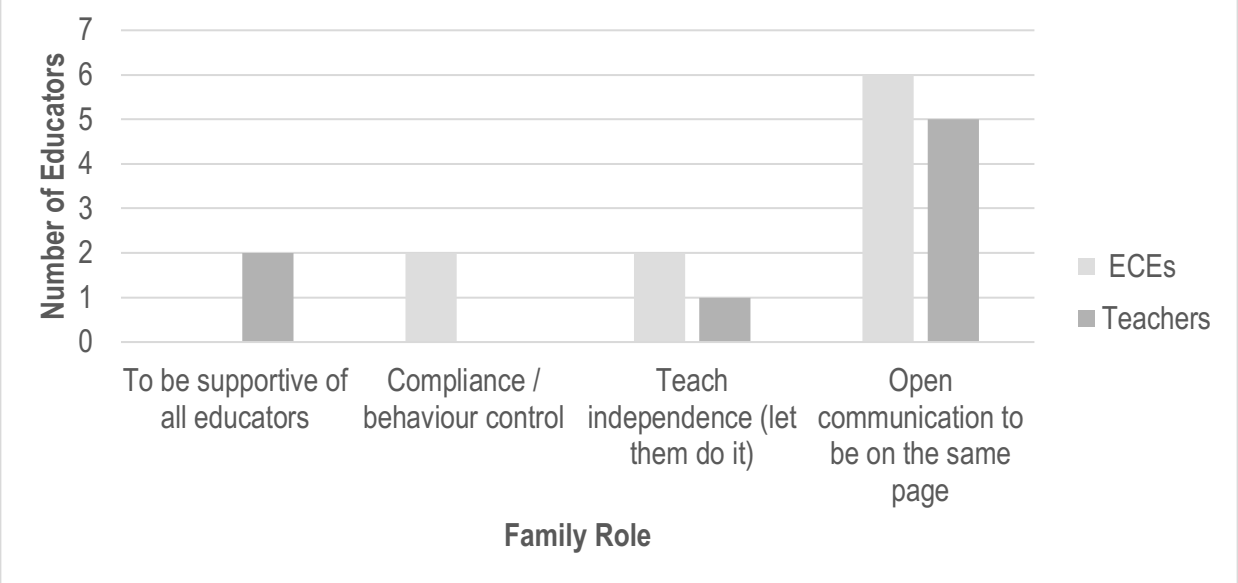
Note. n=12 educators

Five teachers and four ECEs (together forming 75% of all educators) responded that the student's role is to recognize and communicate their feelings, four ECEs (33% of educators) indicated that their role is to do their work and not quit, and two ECEs and one teacher (25% of all educators) suggested that their role is to make independent choices. Other individual comments were made including being engaged in learning, helping peers, showing respect to the people around them, taking responsibility for their actions, and trusting the educator. These responses indicated that educators believe that students are to use their cognitive (thinking) skills to control their responses based on what they have been taught to do during the *Al's Pals* lessons.

Role of the family. When asked what the role of the family is in supporting their children's self-regulation, several educators (four ECEs and three teachers) suggested that the family's role is to maintain open communication with their child's educators (Figure 14).

Figure 14

What Educators View as the Role of the Family in Supporting Children's Self-Regulation



Note. n=12 educators

Comments about the need for open communication represented 46% (11 of 24 responses) of all responses across all educators. Lily suggested that the parents' role is to follow what is being done at school, stating:

> We would hope that they would be flexible, but we can't tell them what to do. We can tell them what we do at school and how it works and then it's up to them whether they take it or leave it, right?

Her response demonstrated her belief that self-regulation is something which is primarily taught in the school and that the family should follow suit by teaching it at home the same way that it was taught in school.

Other educator responses suggested the belief that the role of the family in supporting their child's self-regulation is to teach independence by letting their child do things on their own (one teacher made one comment and one ECE made two comments suggesting this), facilitating compliance and behaviour control at home (two responses from one ECE), and being supportive of all educators (two responses from one ECE), though it was not indicated what this support would entail.

Overall, in describing the roles of the educator, student, and family, educators referred frequently to self-control. They unanimously described a self-control definition of self-regulation, supported by the fact that they view the role of the educator as teaching awareness of feelings, teaching strategies connected to controlling feelings, and modelling these strategies. They perceived the role of the student in the process as complying with the taught strategies, and the role of the family as maintaining open communication with educators, supporting them as well as targeting compliance and independence in the home. These themes are explored more deeply through case study analysis in Chapter Five.

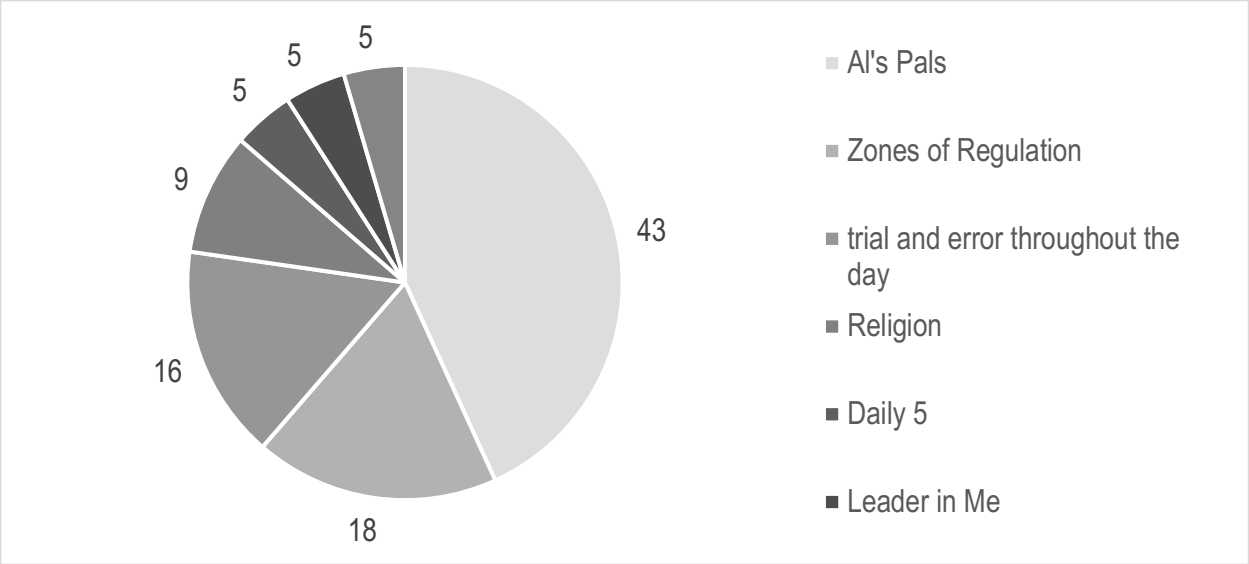
4.2.2. Planning of Teaching and Assessment

4.2.2.1. Plan or process for including self-regulation in the classroom. To expand on the survey responses indicating the ways that educators facilitate self-regulation in their classrooms, I asked each educator to "describe [their] plan or process for including self-regulation in the classroom". I analyzed these results overall to see general themes across all classrooms, as well as by individual classroom because educators work together in a team to plan for how to facilitate the curriculum.

As found in the survey, the interview results (Figure 15) confirmed that there were several programs that were utilized by both teachers and ECEs to promote self-regulation in the classroom. Every classroom team indicated using *Al's Pals* for facilitating self-regulation, and overall, 43% of all responses to this question referred to the *Al's Pals* program. Four of the six classrooms also responded that *Zones of Regulation* was used as part of their program for including self-regulation in the classroom (18% of total responses). Trial and error throughout the day was the third most common response, with five out of six classroom teams indicating this as part of their plan/process (16% of responses). Religion was also included (9% of all responses across four classrooms), Daily Five (5% of responses in two classrooms), and Leader in Me (5% of responses, one classroom). Two classroom teams also reported taking 30 minutes at the end of each day to talk about self-regulation (5% of all educator responses).

Figure 15

Overall Educators' Plan / Process for Facilitating Self-Regulation in the Classroom



Note. Percentages of n=25 overall responses to this question

I looked at what the top four plans/processes were for facilitating self-regulation during the school day in each classroom and for each educator per classroom. Results are shown in Figure 16.

Figure 16

The Top Four Plans / Processes each Classroom Takes to Include Self-Regulation

Note. Numbers in the outer ring represent number of responses made by that educator.

4.2.2.2. Documentation and Assessment of Self-Regulation in the Classroom

I asked educators how they document and assess self-regulation in their classrooms in relation to the programs they are using. Of all the responses across the twelve educators, seven educators reported using anecdotal notes, seven educators reported using photo and video

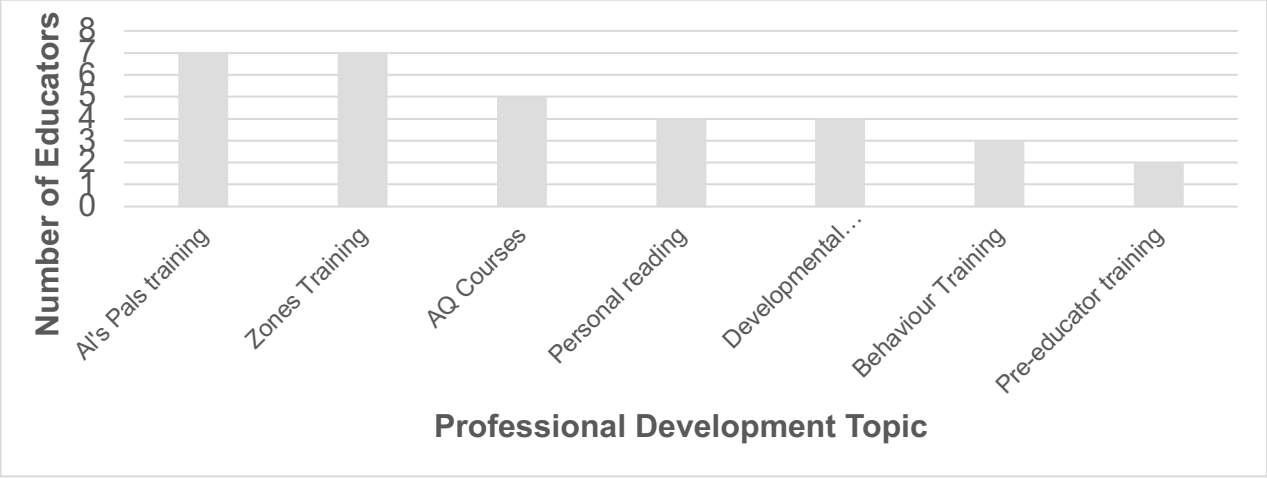
documentation, two educators use checklists (though they did not expand upon the contents of the checklists), two use common lines from the curriculum to describe their student's progress, one uses ABC Behaviour Data Charts, and one uses journals to document the progress of children who are specifically having difficulty with self-regulation. There was some overlap because some educators indicated more than one documentation method.

4.2.3. Professional Development (PD)

4.2.3.1. Self-Regulation Training and Workshops. Educators were asked to describe their professional development experiences to expand on what they had reported on the survey. Seven had participated in *Al's Pals*, seven in *Zones of Regulation* and three in behaviourally-based training (Figure 17). Two educators indicated that self-regulation was part of their pre-service training. Only one third (four of 12 educators) indicated having participated in neurodevelopmentally based training (e.g., Shanker, Tranter, Delahooke; those who use a neurophysiological framework to support children).

Figure 17

Number of Educators Participating in Professional Development Opportunities



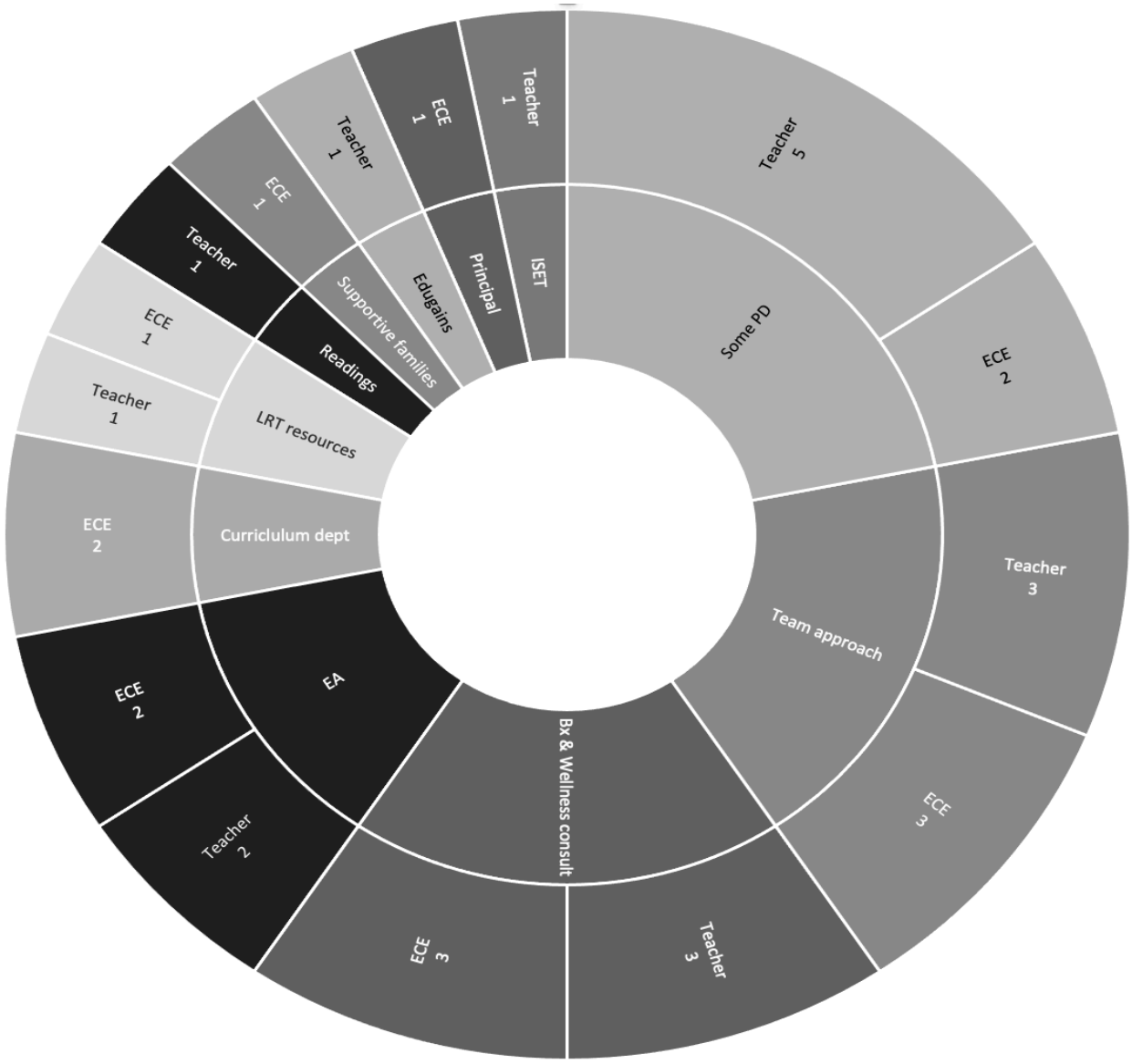
Note. n=12 interviewees

The following professional development opportunities were each reported by the remaining educators (each was mentioned once by different educators): BMS restraint training, brain / body development training, CPLCs, EduGAINS, mental health workshops, personal self-reg development, previous work training, a handout on the Alert Program. and Leader in Me training.

4.2.3.2. Supports Provided by the School or Board. When asked what relevant supports were provided to them by the school or school board to help them embody self-regulation in their classrooms, educators indicated variety of different supports that they found helpful (Figure 21). Most often, educators (3 ECEs and 3 teachers) cited professional development (PD) as helpful, though there were also comments by educators who thought the professional development topics and content could be improved upon. For example, Sofia mentioned, “We don’t hear too much about [self-regulation]. We hear a lot about language — a lot about math, really”. Similarly, Amelie indicated that the professional development provided were “more based on academics than behaviours”, and that there had only been one PD training offered this year. Fay indicated that the PD should be more hands-on in order to see what the process is supposed to look like. Supports that educators found helpful are shown in Figure 18.

Figure 18

Resources / Supports that Educators Found Helpful in Learning to Embody Self-Regulation in the Classroom



Note. By number of educators; n=12

Three teachers and three ECEs stated that a team approach was helpful to facilitating self-regulation. For example, three ECEs indicated that the classroom teacher was a good resource. One of these three further explained that it was beneficial to work with the same teacher several

years in a row and that developing mutual respect and rapport was helpful since students pick up on the relationship. This is an important point that connects to the relationship-based nature of the Ministry's self-regulation framework that will be further analyzed in the discussion chapter. Three teachers and three ECEs also indicated that consultant classroom observations of particular students with behavioural difficulties were helpful. Three educators mentioned a wellness coach visiting their classroom. Rosalie explained that there was a mental wellness lead was for the entire board, and that he shares a monthly newsletter focused on resilience. Her teaching partner, Ophelia, expanded, sharing that the wellness coach taught children meditation. She explained that "she would ring the little bell, and they would all sit there quietly until they stop hearing the bell. Once in a while, it would work". Lily mentioned two people coming in when she and Eden request resources like wiggle seats or weighted products but she was unsure of where they came from or what their roles were.

Three educators mentioned a behaviour specialist that can be invited into the classroom to support specific children's behavioural needs. Rosalie described that the behaviour specialist's role was to help develop behaviour safety plans, with a focus on children that need a rigid structure and routine. Amelie indicated, however, that they typically come just once a month, so it was not found to be enough help. Bev mentioned having access to a school counsellor who filled a similar role as the behaviour specialist, but that behaviours have to be quite extreme before he would come into the classroom.

One teacher (Bev) and three ECEs (Ava, Eden, and Ophelia) indicated appreciating the support of an education assistant (EA) in the classroom. Less frequent responses included readings provided by the board (though one teacher, Fay, who appreciated these also reported not having enough time to be able to read them), supportive families, EduGAINS, a supportive

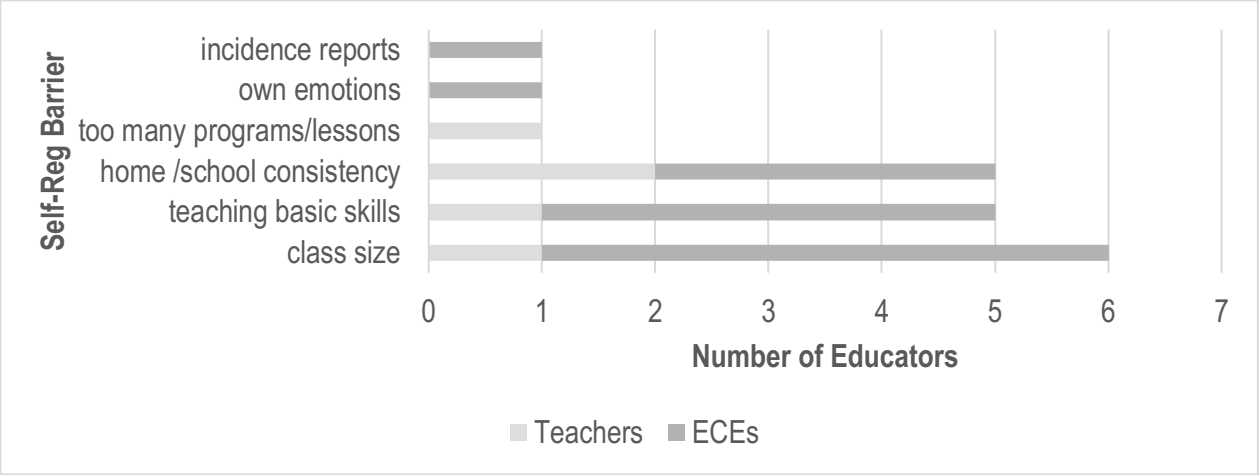
principal, and the ISET process--described as the Instructional School Education Team (one teacher, who did not expand upon the mandate of this group).

4.2.3.3. Barriers to and Needs for Facilitating Self-Regulation in the Classroom.

When asked what the barriers were to their facilitating self-regulation in the classroom, educators reported on seven different barriers (Figure 19). The most common barrier mentioned was class size (reported by two teachers and five ECEs). Sofia indicated that the challenge in large class sizes is "not being able to be with each of the students" throughout the school day. All six educators who cited class size as a barrier indicated an inability to connect one-on-one with each child in the classroom. Ophelia also added that in a large class it is much more likely that one student can take stress from another and give it to another student, and Lily and Ava agreed, highlighting the difficulty in reducing stress in a large classroom because some students have such high needs that educators don't have the capacity to support all children this way. Eve explained that large class sizes are "a barrier for us because it's hard to focus and take time on the student that needs the assistance the most when you have other students that need it too." These perspectives suggest that these educators are beginning to understand how class size can contribute to classroom stressors, a reflective piece that aligns with the Ministry's framework of self-regulation.

Figure 19

Educator-Reported Barriers to Facilitating Self-Regulation in the Classroom



Note. n=12 interviews; n=6 teachers and n=6 ECEs

Having to teach foundational skills such as self-regulation prior to teaching academics was seen as a barrier for classroom success in general (one teacher and five ECEs). Claire explained:

> When I taught kindergarten years ago, there was a JK class and an SK class, and now, of course, they're mixed. Years ago, I remember reading an article that said that in a typical kindergarten class, you can have a nine-year developmental age range. In an SK class that I taught, I had one little girl (actually a couple) that basically had seven-word vocabularies — they couldn't speak — and a girl who was reading chapter books…so you're challenging the student who's already reading and providing for the students who are just learning to talk.

Her response indicated how difficult it can be do developmentally appropriate activities for such a large developmental range. She also mentioned that their lack of basic skills like counting (because they are coming in so young) is a barrier to being able to do traditional group instruction, where so many skills are taught.

Lily agreed that in kindergarten, some children might not be mature enough, or might not have a self-regulation toolkit to work with, in order to fully participate in the classroom. Ava added to this idea, reflecting that:

> You get a lot of flak from the grade one teacher saying "Well, how come she's not doing this or doing that?" and we had nothing to go on. We're trying to guess for two years what this child needs, so when they go on to grade one, grade two, grade three, whether there's a learning issue or anxiety issue or mental health issue, sometimes that's already red flagged by us but no one red flags for us. So we're at the bottom, trying to prepare them.

Lily's comment expressed the importance of accessing mental health supports early. Amelie, another ECE, expanded on this idea, identifying her belief that the mental health needs of kindergarten children may be overlooked because the emphasis is on older children:

> Sometimes kindergarten gets overlooked. It's more the older children that they seem to be pinpointing right now. We do have one little guy right now with Autism in our class this year and it wasn't until the behaviours got to a real extreme that this behaviour person, that had been in for the older students, did observe him as well, but he wasn't technically on his caseload.

She was concerned that the mental health staff in the board do not realize the behaviour extremes happening in kindergarten and that the children lack preliminary self-care skills (e.g., blowing one's nose, using the washroom). She supported others' thoughts that the need to focus on these skills limits the academic learning that can occur in preschool and kindergarten. Her perspective is that developmentally, children are not where they should be, and therefore the children become frustrated when educators try to teach them, resulting in behaviour problems in the classroom.

Home/school consistency was another reported barrier to facilitating self-regulation in the kindergarten classroom, where educators wished there could be more consistency between the approaches used in school and at home. Two ECEs, Amelie and Eliza, cited the need for parents to stop doing everything for their children at home and to encourage independence because children know how to do things but get frustrated at school when things are not done for them as they are at home. Eliza stated, “Sometimes it’s hard because it kind of seems like you’re helping them at school but it kind of gets erased at home because it’s not consistent”. Other barriers reported by individual educators include having too many programs and lessons to implement throughout the day, one’s own emotions as an educator, and having to complete incident reports without receiving any feedback, making them feel like the practice is a poor use of the educators’ time.

4.2.3.4. Self-Assessment of Self-Reg Understanding and Embodiment. Educators were provided with a rubric during the interview to self-assess their abilities in the Shanker Self-Reg © framework developed to guide their self-regulation practices in the classroom (The MEHRIT Centre, 2017; Figure 20). During the interview, I screen shared the rubric, and asked educators to rate themselves as emerging, developing, applying, or extending, on each of the five steps/principles of Shanker Self-Reg, plus personal self-regulation.

Figure 20

Shanker Self-Reg Competencies Rubric (The MEHRIT Centre, 2017)

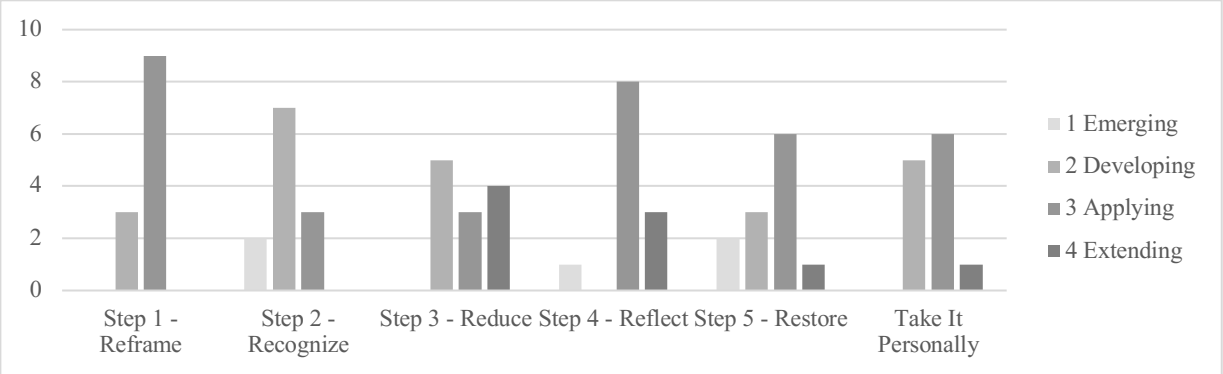
SELF-REG COMPETENCIES	EMERGING	DEVELOPING	APPLYING	EXTENDING
Step 1: Reframe the Behaviour	Explores examples of excessive stress. Considers the difference between misbehaviour and stress-behaviour.	Recognizes some signs of excessive stress. Recognizes some examples of stress-behaviour.	Reads the signs of excessive stress and reframes the behaviour. Distinguishes between misbehaviour and stress-behaviour.	Reads and reframes behaviour in self and others while applying all of the 5 steps of the Shanker Method™ of Self-Reg.
Step 2: Recognize the Stressors	Understands that there are many different kinds of stressors. Understands that in Self-Reg we look for stressors in 5 different domains: biological, emotion, cognitive, social, and prosocial.	Looks for significant stressors in all of the 5 domains. Understands that stressors from different domains interact with and exacerbate each other.	Identifies significant stressors in all of the 5 domains. Analyzes and describes how stressors from different domains interact with and exacerbate each other.	Identifies and analyzes significant stressors as part of a dynamic 5 domain system in self and others while applying all 5 steps of the Shanker Method™ of Self-Reg.
Step 3: Reduce the Stress	Understands that environments have stressors to an individual's self-regulation and that they can be reduced.	Understands that stressors in all of the 5 domains can be identified and reduced or removed.	Applies strategies to reduce or remove stressors in all of the 5 domains of Self-Reg.	Lowers the stress load experienced by self and others by taking action to reduce and remove identified stressors. This is part of the application of the 5 steps of the Shanker Method™ of Self-Reg.
Step 4: Reflect: Enhance Stress-Awareness	Understands that quiet is not the same thing as calm. Recognizes that many individuals do not know what calm feels.	Begins to notice what "calm" feels like and to recognize genuine calm and some of the other arousal states in self and/or others.	Applies developmentally-appropriate approaches to learn or teach what calm feels like and to become aware of the experience of all the arousal (stress) states.	Applies individual and "whole group appropriate" strategies to enhance stress awareness while applying all of the 5 steps of the Shanker Method™ of Self-Reg.
Step 5: Respond: Develop Personal Strategies to Promote Restoration & Resilience	Understands that strategies to restore energy and to cope with / adapt to stressors is unique for each person. It is not a one-size-fits all process.	Identifies the practices that are restorative to personal energy stores for self or others. Identifies existing adaptive (and maladaptive) coping strategies to respond to excessive stress.	Applies adaptive coping strategies from the personal/ individual Self-Reg toolbox kit to respond to excessive stress. Applies personal strategies to restore energy.	Builds own (or supports another to build) a personally meaningful toolbox of Self-Reg strategies to promote restoration and resilience as part of applying all of the 5 steps of the Shanker Method™ of Self-Reg.
"Take it Personally"	Understands that everyone, including parents and teachers, has a limbic system and experiences various arousal states throughout the day.	Reflects on the personal triggers (stressors) played in a stressful situation or an experience with another individual or group. Reflects on personal self-regulatory strengths and areas for growth.	Reflects, during as well as after a stressful experience, on own triggers. Demonstrates awareness of own self-regulatory strengths and areas for ongoing development.	Practices all 5 steps of the Shanker Method™ of Self-Reg.

www.self-reg.ca | The MEHRIT Centre, Ltd. | 2016™

Figure 21 shows how educators responded to the self-assessment rubric, rating themselves as either Emerging, Developing, Applying, or Extending on each of the five steps/practices, plus an additional self-assessment involving their own personal self-regulation.

Figure 21

Number of Educators Selecting Each Response for Each Step of the Shanker Self-Reg © Rubric



Note. n=12

Overall, nine of twelve educators felt their ability to reframe behaviour qualified as application. Seven of the twelve felt that their ability to recognize stressors was *developing,* yet educators seemed to feel that they were nonetheless able to reduce stressors in the classroom. Three educators felt they were applying the skill of reducing stressors, and four felt they were extending this skill. It was not specified what they were reducing when they did not feel confident in their ability to recognize stressors, which will be discussed in Chapter 6. Eight of the twelve educators felt they were applying the skill of *reflecting*, and six felt they were applying the skills of *restoring.*

The aspect of personal self-regulation is an important and possibly controversial one. Shanker (2016) suggests, based on the co-regulation work of Schore (2012a) and Tantam's idea of the *interbrain* (2018), if an educator is not able to personally self-regulate, it will be very difficult to model and embody the practices themselves within the classroom. However, only one educator (Claire) felt she was extending the practice of personal self-regulation; five (just under half) felt that this skill was still developing, and six felt that they were applying this skill.

4.2.3.5. Teamwork: **Sharing their Own Self-Regulation Knowledge with Others.** Responses to this question were minimal and since educators did not expand on this topic, it was not a focus of the data analysis.

4.2.4. COVID-19: Remote Teaching and Learning Context

In March 2020, schools closed and instruction in kindergarten classrooms migrated to online instruction. I acknowledged in my interviews with educators that it may not have been possible for them to facilitate self-regulation in the classroom because of changes due to COVID-19 and requested that they reflect on their experiences before the schools were closed. I also asked educators additional questions about their experience facilitating self-regulation in the context of remote instruction (Figure 22). This section was an addendum to my original research questions, so is included here for context, but is not reported with detailed quotes.

Figure 22

Additional Interview Questions Regarding Teaching Self-Regulation During COVID-19

COVID-19; REMOTE TEACHING AND LEARNING

Introduction: I want to acknowledge that facilitating all parts of the curriculum is an overwhelming task that may not be possible at this time. In fact, I'm aware of the Ministry letter directing a focus on Literacy and Math. However, this is a unique opportunity to have conversations about educator perspectives on self-regulation that may contribute to understanding educators' needs in its facilitation. I'm interested in what self-regulation could potentially look like through remote instruction.

1. Are you able to address the Self-Regulation and Well-Being frame of the Kindergarten Program through distance learning? If so, how (what activities are you suggesting, if any?) What have been your barriers?
2. I had asked you previously about your assessment of Self Reg and Well Being. Given the current circumstances, are you doing any assessment of this frame?
3. Have you been able to provide any resources (books, articles, videos, websites, activities) to parents so they can support their child's self-regulation? What have you provided?

Not surprisingly, none of the educators reported being able to address self-regulation *effectively* through remote teaching and learning. Some did make an attempt to address self-

regulation by giving students space and not overwhelming them with work (two educators), encouraging students to connect with one another online (one educator), and acknowledging with their students that it was okay to be having a hard time (two educators). Educators also commented on the ways they were supporting parents through online teaching and learning, including telling parents that there was no pressure to complete the activities posted online (three), maintaining open and honest communication with parents (three), and providing resources for parents to assess academic progress such as levelled reading. One educator commented that this kind of measurable academic activity seemed to be what parents wanted to see and that they did not necessarily find value in something like meditation. In response to questions one and three, educators reported that they posted some resources online for families and students as illustrated in Table 8.

Table 8

Self-Regulation Resources that Educators Posted Online

Resource Posted Online	Number of Educators Posting the Resource
Al's Pals online videos	3
Spencer Stays Inside videos, which are puppet videos talking to children about safety during COVID (https://www.spencerstaysinside.com)	1
Meditation and mindfulness lessons (pre-recorded breathing and meditation exercises, yoga)	4
Specific activities aimed to simply increase family time together (watching the Snowbirds flyover, science experiments, spending time outdoors together)	41

Regarding assessment, two educators noted that they looked at work that was submitted online, but that the board had specified that assessment of online learning beyond the date that

the schools closed and went online, just before March Break, was not to be reflected in the final Communications of Learning report card.

There were several additional interesting comments which emerged from these discussions about online teaching and learning. All 12 educators discussed the challenges inherent in attempting to teach kindergarten online. Four educators indicated that while the Ministry allowed chats or online learning, the teacher's union recommended that educators refrain from it because of potential liability (if something is said the wrong way it can be misinterpreted, or the potential to witness events happening in the home that would be reportable to the Ministry). Three educators noted the technological challenges of online learning for young children, including logging on to computers (3 educators) and to Google Classrooms (1 educator), and loading homework (1 educator), which may be why participation is so minimal (reported by 9 educators). Ten educators specified that they had been given Ministry direction to focus on the literacy and math frame of the curriculum. It is interesting that this was the one frame that was recommended, rather than the other three (Self-Regulation and Well Being, Belonging and Contributing, and Problem Solving and Innovation; Ontario Ministry of Education, 2016b). One might assume that there should be equal emphasis on all frames, or an increased focus on Self-Regulation and Well-Being, given that the pandemic has created stress among staff and students.

4.3. Communications of Learning

Communications of Learning (CoL) are the report cards provided for kindergarten students in Ontario. As noted in my literature review, they are designed to be anecdotal, describing student activity and progress in each of the four frames of the *Kindergarten Program*. They are written by teachers and typically include input from the ECE. I analyzed the CoL data

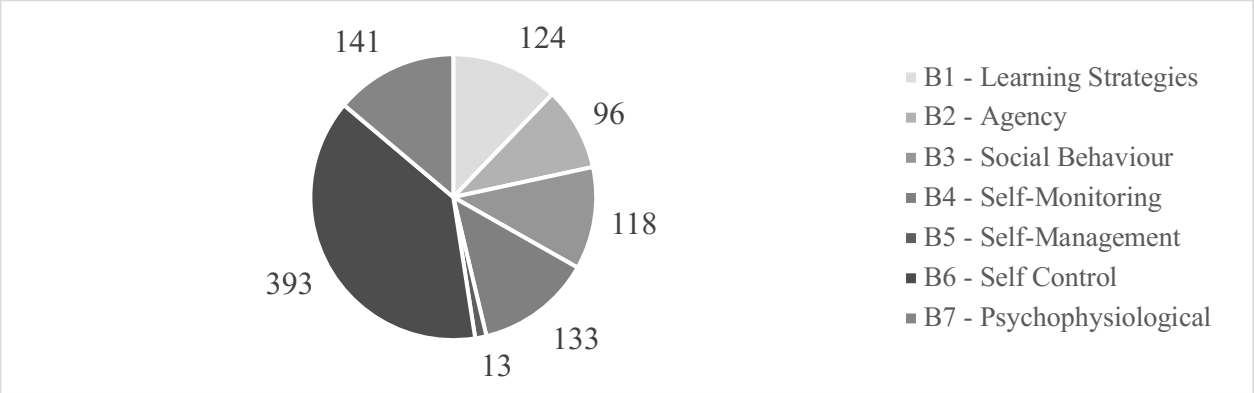
for Junior and Senior Kindergarten students from the six classroom teams I interviewed. These reports were prepared in June 2020 and referred to classroom assessments that occurred prior to schools pivoting to online instruction in March 2020. CoL data supported the definitions (described in the previous sections on surveys and interviews) that educators were using to understand and facilitate self-regulation in their classrooms.

4.3.1. Definition

Communications of Learning (CoL) data, like the survey and interview results, also indicated educator use a self-control definition. Overall, of all the comments in the Communications of Learning, 39% (393 of 1018 total comments across 147 report cards) referred to concepts that are consistent with self-control (see Figure 23). Many of the comments referred to control of the fine and gross motor muscles, giving examples of activities children did during gym class such as competence in an obstacle course, which are skills that are included in the Self-Regulation and Well-Being frame of the *Kindergarten Program*. Communications of Learning also included comments about behaviour control, such as returning schoolwork, completing in-class schoolwork on time, raising one's hand before speaking, listening to others and staying focused, and following instructions and class rules. There were also comments about controlling inner thoughts and actions. This phrase was frequently used but not further explained. Additionally, the phrase was often used as a standalone comment within other comments, such as "using meditation to control one's inner thoughts and actions".

Figure 23

Overall Educator Definitions of Self-Regulation: Communication of Learning Comments

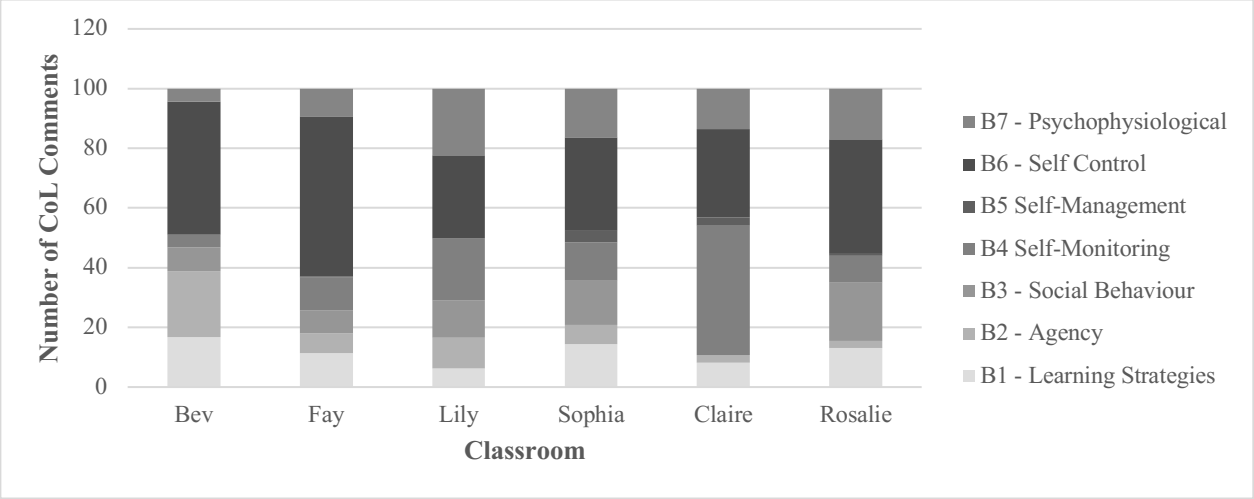


Note. n=1018

An analysis of the data by individual classroom teachers reveals that five of the six classroom educator teams supported a predominantly self-control definition of self-regulation when describing their students, but one classroom teacher supported a self-monitoring definition (Figure 24). This could be because of the small number of unique comments included in this set of report cards (n=37), that focused on self-reliance and independence, which were copied across each report card. These assessments will be further examined in the discussion.

Figure 24

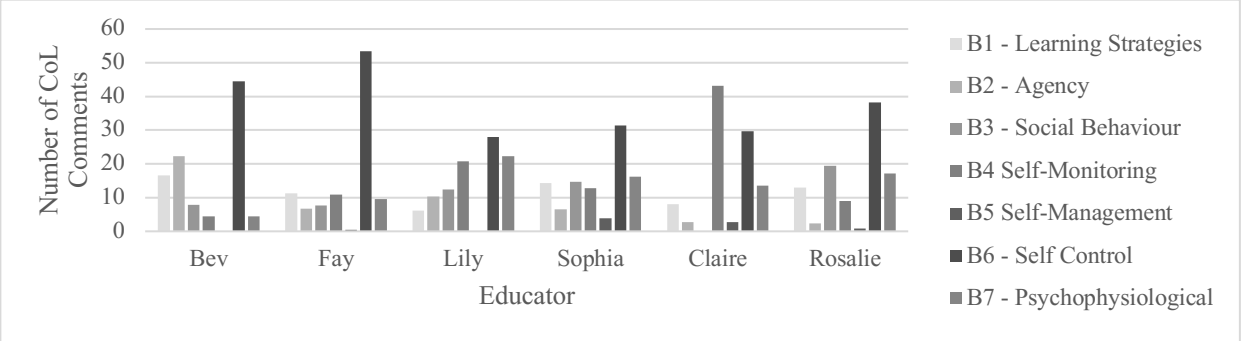
Proportion of Definition Categories Represented in Each Classroom's Communication of Learning Comments



I also examined the total number of comments made by each teacher in each of the different categories in order to see whether some of the reports may have been more detailed than others. Results are shown in Figure 25.

Figure 25

Number of Communication of Learning Comments per Classroom



Self-control comments shown in Figure 25 are prevalent, with five out of six classrooms using primarily self-control terminology to describe their students' self-regulation, with the exception of Claire, who also included many comments about self-monitoring in addition to a

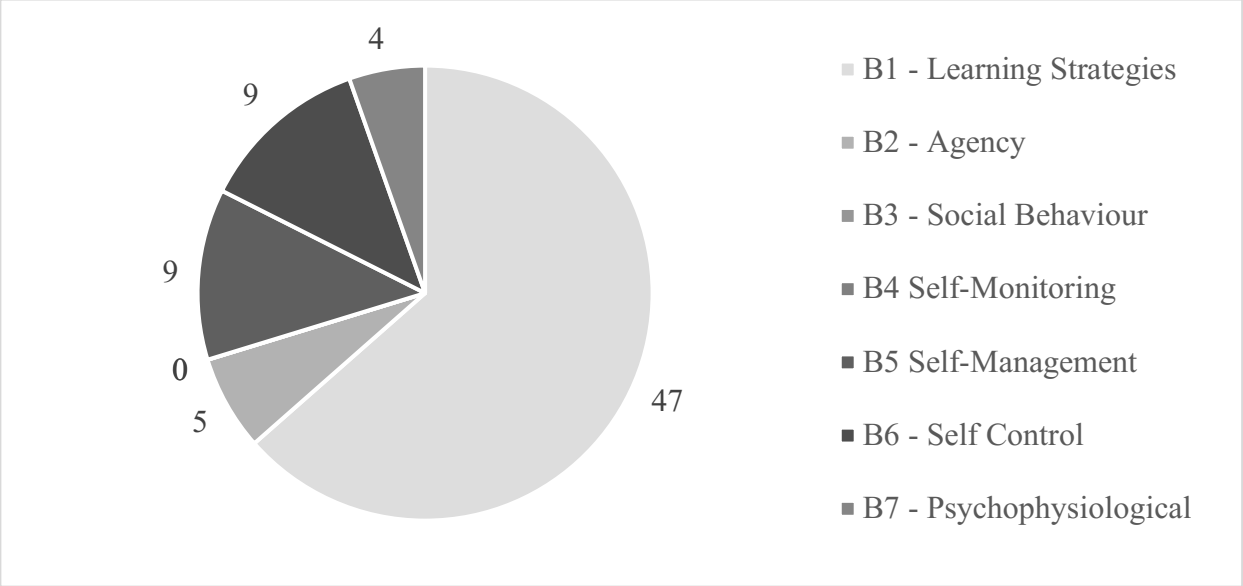
high proportion of self-control comments. In addition, five of the six educators (with the exception of Lily), self-control comments were used more than twice as often as psychophysiological comments; for Bev and Fay, five time more often. Rosalie and Lily showed the highest number of comments referring to psychophysiological descriptions of self-regulation behaviours (n=17 and n=22 respectively).

4.3.2. Facilitation

Communications of Learning (CoL) are purported to describe children's behaviours in each frame of the curriculum, and educators often documented how well each student did on a specific task, such as completing an educator-created obstacle course to intentionally assess motor control. Consequently, I also included in my analysis the activities that were included on the CoL to describe activities that educators felt were relevant to the self-regulation and well-being frame. The CoL data, like the survey and interview data, showed that educators facilitate self-regulation using a self-regulated learning approach, with 64% of all CoL comments related to self-regulated learning facilitation (Figure 26). There were few comments pertaining to facilitation in these report cards, since the focus was on the children's progress as opposed to the activities that the educators facilitated.

Figure 26

How Educators Facilitate Self-Regulation in their Classrooms: Communication of Learning Comments



Note. n=74

4.4. Classroom Observations (Facilitation)

Classroom observations were completed with adaptations due to the COVID-19 pandemic. Some educators had shifted to different classrooms or online classrooms as a result of COVID when schools re-opened in the fall. I had planned to observe each of the 12 educators I had interviewed. However, Sofia and Lily had moved to online teaching roles, Claire shifted to an administrative role, and Amelie began working with a teaching partner who did not want her classroom to participate due to the already increased demands of teaching during a pandemic. I observed the remaining eight educators (four months after their interviews and surveys were completed) via Zoom online videoconferencing since the school board restricted non-essential visitors from entering the schools. Of these educators, Bev and Ava were still working together in the same classroom so were observed together, Rosalie and Ophelia were still working

together in the same classroom and were observed together, Fay and Eve were working in separate classrooms and were separately observed in their respective classrooms, and Eliza and Eden were observed individually (their teaching partners, Sofia and Grace, were not observed). The observation data was twofold, including: 1) the Self-Regulation Classroom Environment and Implementation Checklist (SCEIC) scores of observed Ministry-recommended self-regulation environmental conditions, facilitation behaviours, and relationship-building behaviours relevant to self-regulation in the classroom, and 2) field notes describing the classroom environment as a whole. The SCEIC will be described in the next section and can be seen in full in Appendix C.

4.4.1. Self-Reg Classroom Environment and Implementation Checklist (SCEIC) Findings

I observed each educator's behaviours while teaching to determine whether they demonstrated any of the 33 self-regulation behaviours recommended by the Ministry. I also observed whether they demonstrated behaviours that did not align with the Ministry recommendations. For example, item 24 in Column A indicates recommendations (*goes to child as quickly as possible when upset to coregulate and share their calm)* versus Column B (opposite behaviours) which indicates, *asks a child to calm themselves down when they are upset* (Appendix C). Rather than analyzing this data through the number of educators employing each practice on the SCEIC (though this data can be seen in Appendix K), it was more relevant to my research questions to analyze holistically each educator's and team's overall practice for the SCEIC data to examine what proportion of the Ministry's self-regulation recommendations each educator / classroom was observed facilitating.

I tallied the number of items in each SCEIC category to determine how many recommended practices (column A in Table 5) each educator used in each of three categories (physical environment, facilitation, and relationship), then calculated the percentage of the

Ministry-recommended practices listed in each section that each educator exhibited during the observation (the third column in each category of Table 9). The numbers do not add up perfectly since there were some items that either were not observed, or somewhere both were observed.

Table 9

Tally of SCEIC Items per Observation Category for each Educator

	Physical Environment (8 items)			Educator Facilitation (12 items)			Relationships (13 items)		
	A	B	A/tot (%)	A	B	A/tot (%)	A	B	A/tot (%)
Classroom 1a									
Bev (teacher)	5	4	56	3	7	30	3	6	33
Ava (ECE)	5	4	56	3	9	25	4	6	40
Classroom 1b									
Fay (teacher)	1	6	14	1	8	11	2	10	17
Eve (ECE)	1	7	13	5	5	50	7	6	54
Classroom 2									
Lily (teacher)	0	7	0	4	5	44	8	4	67
Classroom 3									
Eliza (ECE)	0	8	0	0	10	0	2	8	20
Classroom 5									
Rosalie (teacher)	0	7	0	0	12	0	1	7	13
Ophelia (ECE)	0	7	0	0	10	0	3	9	25
Mean:	2	6	17	2	8	20	4	7	34

I examined the difference between teacher and ECE SCEIC scores across categories and found that both teachers and ECEs demonstrated very similar patterns of self-regulation facilitation. Because of this similarity, I analyzed results for teachers and ECEs together.

I observed that Bev and Ava each facilitated self-regulation environmental conditions and behaviours in 56% of situations. Fay and Eve exhibited 14% and 13% of the Ministry-recommended environmental conditions respectively, whereas the Lily, Eliza, Rosalie, and Ophelia had not exhibited any.

The environmental recommendations on the SCEIC included the items indicated in Table 9 as well as in Appendix K.

Table 10

Environmental Recommendations on the SCEIC

SCEIC Environmental Recommendation
Environment set up to accommodate small or large groups
A variety of lighting sources are accessible and flexibly used throughout the day (e.g. natural light, lamps)
A variety of seating options are available
Different spaces within classroom for multiple purposes that are flexible in the moment
Walls and instructional areas are mostly bare; materials posted are referenced
Includes quiet area to block out sensory stimulus (e.g. tent, visual block of rest of classroom, headphones) that child can choose to use as needed
Supporting sensory materials are made freely available to all as needed (e.g., exercise balls, exercise mats, squishy balls, noise-cancelling headphones)
Visuals are used to remind children to self-reflect on how they feel and are individualized based on need

Overall, classrooms included only 17% of the Ministry-recommended environmental conditions, but this could have been the result of the board's COVID regulations. Educators reported that they were told to remove as many materials as possible from the classroom, including things posted on the walls, to rearrange seating to provide physical distancing, and to remove soft surfaces. Specific examples of what educators were doing in the classroom with regard to each of these listed recommendations were also recorded for each item, which will be discussed in the next section.

In terms of facilitation methods, one classroom's educators exhibited 30% (teacher) and 25% (ECE) of the Ministry-recommended self-regulation facilitation behaviours. The second

classroom's teacher and ECE exhibited 11% and 50% respectively, one teacher exhibited 44%, and the other did not exhibit any.

Ministry-recommended facilitation practices included on the SCEIC are shown in Table 11.

Table 11

SCEIC Facilitation Practices

SCEIC Facilitation Practice
Self-regulation strategies are available for students to use individually (e.g., visual schedule, yoga, breathing exercises)
Extrinsic rewards are seldom used and are limited to praise / acknowledgement.
Educator engages child in conversation about his/her arousal levels and what affects them (includes noticing and naming the self-regulation strategies students are using in the moment)
Educator demands placed on children are responded to with compliance by the student
Educator attempts to help the child regulate with calm paraphrasing of what happened (declarative language) and empathy
Educator guides students through daily experiences which help them learn what to avoid, what to engage in, to affect one's own regulation
Educator proactively (not in response to behaviours) asks students about how their 'engines are running'. Help them learn what it feels like to be calmly focused and alert. Guide child through self-discovery
Educator engages in communication with the child before and after self-reg-based activities and practices to reflect and self-discover
Encourages regular physical activity reflexively (as needed) as well as reflection before and after on how it makes the student feel
Activities are individualized to allow for individual needs with options for varying physical and cognitive levels
Facilitates children's efforts to take reasonable risks, test their limits, and gain increasing competence and a sense of mastery through active play and social interactions
Educator appears regulated themself (calm voice, varied affect, engaged with others)

With regards to developing educator-student relationships, teacher-ECE teams, in the order described above, demonstrated 33% and 40%, 17% and 54%, 13% and 25%, with the remaining teacher demonstrating 67% and ECE demonstrating 20% of Ministry-recommended relationship behaviours.

The expected relationship-based educator practices are shown in Table 12.

Table 12

SCEIC Relationship Facilitation Practices

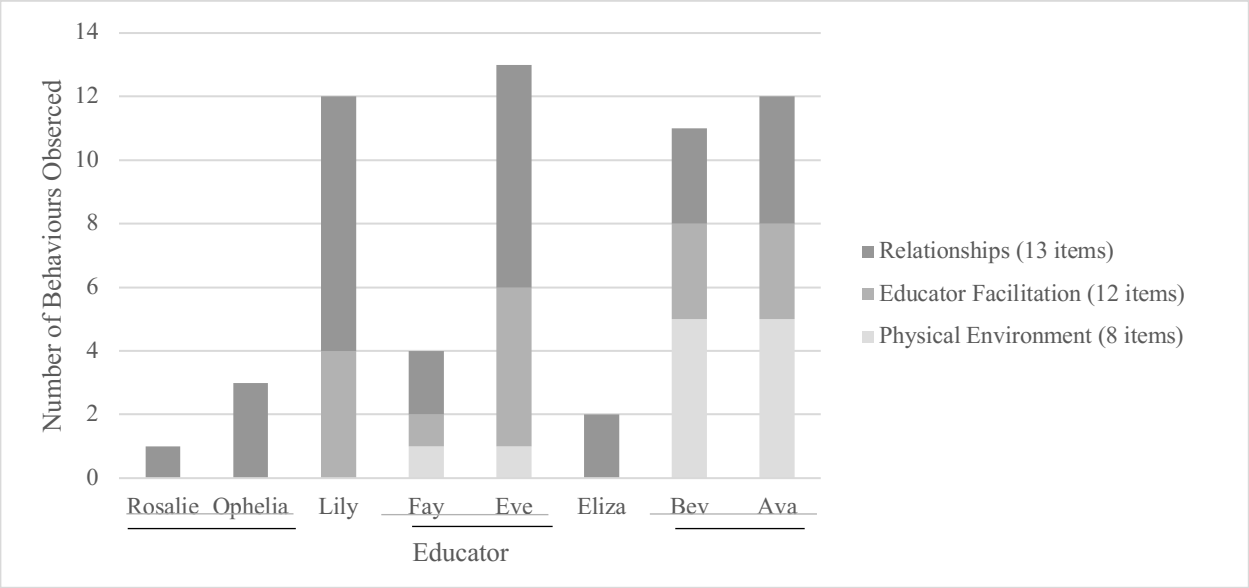
Relationship-Based SCEIC Practices
Goes to child as quickly as possible when upset to coregulate (share their calm)
Responds calmly to student distress
Responsive student relationships where students are given independence based on their presumed competence
Acknowledges / responds to / mimics students' non-verbal communication, including facial expressions and tone of voice.
Uses individualized nonverbal communication effectively (individualized use of eye contact, facial expression, tone of voice, posture, gestures and touch, timing, and intensity of response) to engage students.
Focuses on strengths rather than challenges to build skills
Helps students to identify feelings and emotions in self and others, discuss why they might be feeling that way, and use words to identify the meaning of their own and others' expressive language
Engages in reciprocal interactions with children where children are both initiators and equal partners
Models and teaches in the moment the practice of kindness towards other people and all living things, shows concern for their well-being, acts with empathy towards them, and practices including others

Relationship-Based SCEIC Practices
Bullying, harassment, and aggression are responded to with connection and empathy (e.g. empathy, hug, space, time as needed)
Allows space and time for problem solving, rather than jumping in quickly to prevent problems from occurring
Focuses on social and personal development over academic skills
Capitalizes on opportunities for one-to-one interactions during daily routines

Looking at this data overall (across all categories) to see which classrooms showed the highest numbers of recommended self-regulation practices (Figure 27), it is evident that fewer than half of the Ministry-recommended behaviours were exhibited by educators during classroom observations, especially in creating environmental conditions. Specific examples of what educators were doing in the classroom with regard to each of these listed recommendations were also recorded for each item, which will be discussed in the next chapter.

Figure 27

Overall Educator Self-Regulation Behaviours Observed



Note: n=33 behaviours across all three categories. Classroom teaching teams underlined together.

4.4.2. Examples of Observed Educator Behaviours (SCEIC Examples)

In addition to quantitatively recording whether or not the behaviour occurred, for each behaviour on the SCEIC, I also made a qualitative note describing an example of a behaviour that each educator exhibited during my observation. Appendix K details the examples of educator behaviours observed in each category of observation (physical environment, facilitation, and relationship), with frequencies showing how many educators were observed engaging in that behaviour for each SCEIC item. This section highlights overall findings, which will be explored in greater depth in Chapter 5.

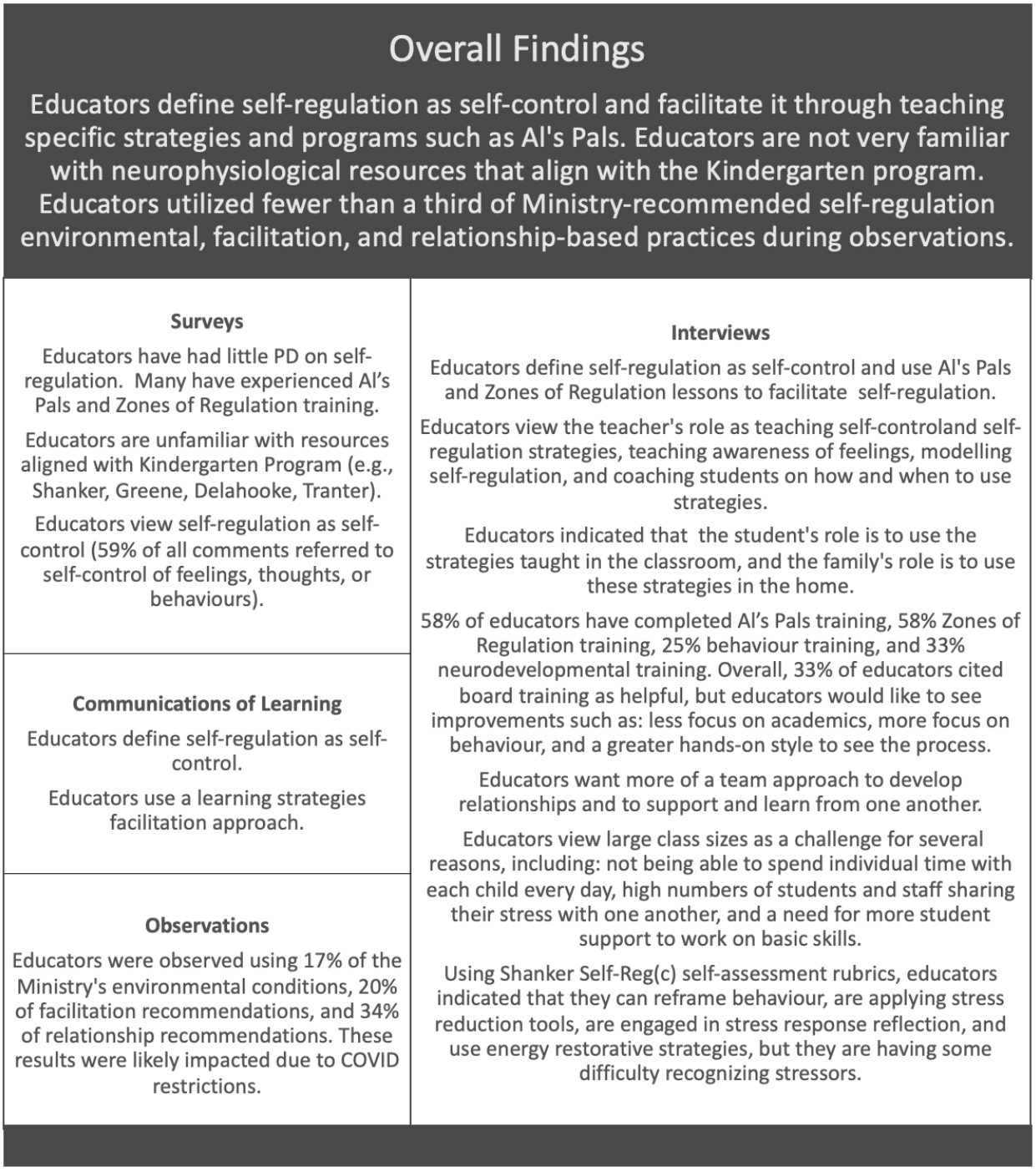
In my data analysis, I discovered that overall educators have created environments where there is standard assigned seating for most of the time, standard fluorescent lighting, materials posted on walls that is not referenced, the use of one large space with few alternate spaces for different purposes, and some sensory materials offered for those experiencing challenges remaining still and listening. Regarding facilitation, there were no specific self-regulation lessons taught other than emotion recognition from pictures. Praise was used for complying with expected behaviours (following rules and being calm), consequences were threatened for escalation during learning centers, and physical activity was scheduled in, but not used reflexively. However, teachers spoke with a calm demeanor, verbally expressing clear instructions and making an effort to engage in discussions about how students were feeling when having difficulty focusing or when sad. In terms of how they engaged in their relationships with students, teachers were engaged in monitoring the entire class' focus on the planned group instruction, frequently referring to the rules and expectations to maintain a calm and predictable

environment. There was some responsiveness to student problems and encouragement of problem solving as well as modelling of empathy and kindness in conflict situations. The majority of the time, educators were focused on academic lessons with few opportunities for one-to-one interactions.

Overall, the findings here demonstrated that educators use a self-control definition of self-reg and tend to facilitate it using a learning strategies approach rather than a neurophysiological framework (Figure 28). To further examine these findings and gain some context surrounding what might influence their approaches, I analyzed four cases (one teacher/ECE team per class) in Chapter 5. The two classrooms selected exemplified the highest and lowest percentages of Ministry self-regulation recommendations used during classroom observations, as well as higher and lower levels of observed student engagement, respectively.

Figure 28

Summary of Overall Findings



Chapter 5: Case Studies

5.1. Introduction

Instrumental case studies as a data analysis process are used in research to provide an in-depth understanding of a specific issue or concern across multiple data sources (Creswell, 2013). For the current study, I selected the teacher and ECE from each of two quite different classrooms for a deeper analysis of the similarities and differences among their understanding and facilitation of self-regulation in the kindergarten classroom. Both classrooms are within a small northern Ontario city. Bev (a teacher) and Ava (an ECE) have worked together for six years as a teaching team and observations revealed their classroom to be a calm and engaged environment for students. Their classroom was comprised of 24 students. Rosalie (a teacher) and Ophelia (an ECE) described concerns with behaviour challenges in their classroom and observations revealed students that were less engaged. Their classroom included 28 students. The analysis includes a comparison between these educators and their respective classrooms.

5.2. Classroom 1a: Bev and Ava

5.2.1. Physical Environment

Bev and Ava's classroom was set up with several tables and a variety of seating options during group instruction (see Figure 28). Sensory materials were made freely available to all students as needed on a self-regulation table to the right of the teacher's easel. There were family photos displayed in the cubby area and a Smart Board on the right of the photo that was not referenced throughout the interview or observation. There is typically an *Al's Pals* poster on the wall that provides strategies for students to calm down, but that was not posted this year due to COVID restrictions. There was a small prayer area with a child-sized couch on the right, as well as a separate Al's Place area with a comfortable chair against a wall near the back door.

Figure 29

Bev and Ava's Classroom

Both educators seemed to be calm and self-regulated throughout the day, evidenced by their calm tone of voice, slow and deliberate movements, and supportive social engagement with students. They followed a daily routine to which the students were accustomed with clear expectations and little need to reiterate expectations or rules. Much of the day was play-based with short periods of group instruction. Students were calm and compliant, and few overt demands were placed on them since each followed the expected routine, which oscillated between movement-based activities and seated classroom instruction. Interactions were both student- and educator-initiated and there were few behaviour challenges noted.

5.3. Bev

5.3.1. Demographics: Experience and Training

Bev is a teacher with 16 years of teaching experience (10 of them in kindergarten). Bev participated in a three-hour workshop on self-regulation, school board and in-school professional development, and mental health workshops for teachers on Professional Development days. As she describes:

> We had guest speakers and whatnot. I can't remember exactly. They do give [training] for us as well because I think self-regulation obviously starts with us. [The] tools that we use for ourselves, we can give to our kids as well.

Bev's understanding that self-regulation begins with adults relates to research on co-regulation and the importance of sharing one's calm to support others as described by Shanker (2016) and Tranter (2018) based on research by Porges and Furman (2011).

Educators were asked to self-assess their ability to facilitate each principle of Shanker Self-Reg (Reframe, Recognize, Reduce, Reflect, Respond) as Emerging, Developing, Applying, or Extending (see Appendix I). Bev indicated that her ability to reframe, recognize stressors, and restore energy was still developing. Conversely, she noted that her skills in reducing stress and reflecting upon the impact of stressors and restorative practices as extending, which demonstrated that she was not yet applying her ability to reframe, recognize, and restore. However, she felt confident in her ability to reduce stressors and reflect upon the impact of certain stressors. It was not clear how she was able to fully reduce stressors when her ability to recognize stressors was still developing. Knowing that Bev's background was mostly founded on *Al's Pals* training and the *Kindergarten Program*, I next examine the ways she understands self-regulation.

5.3.2. Definition of Self-Regulation (Research Question 1)

In her interview, when asked to state how she defined self-regulation, Bev described her definition as follows:

> Self-regulation is being able to regulate your emotions under stressful situations. It's okay to be angry. It's okay to be sad. It's okay to be happy because sometimes you need to self-regulate your happiness. You can get out of control. So, it's being able to regulate your emotions.

Bev's definition illustrates her understanding of self-regulation as control of one's emotions, although she does non-judgmentally acknowledge that having different kinds of emotions is okay. She further expanded on her understanding by describing self-regulation as a lifelong process that is different for every person:

> There's no magic potion. It's being in tune with your feelings and working daily, and as an adult, I have to work daily at it. It's not something I've acquired at my age. It's like working out. Mental health is like working out. You don't stop. It doesn't get easier.

Bev's description of self-regulation as individualized was aligned with the *Kindergarten Program*'s neurophysiological framework of self-regulation as was her understanding that there is "no magic potion" but contradicts her reported use of *Al's Pals* and *Zones of Regulation* lessons to teach self-regulation as a whole-class activity. Furthermore, she made an analogy comparing mental health to working out, similar to Muraven and Baumeister's (2000) model of self-regulation as a muscle needing to be trained and strengthened. It was evident that Bev's experiences and training led her to adopt a self-control understanding of self-regulation; however, she also integrated some aspects of a neurophysiological framework. With this understanding, how did she facilitate self-regulation in the classroom?

5.3.3. Facilitation of Self-Regulation (Research Question 2)

In her interview, when asked to describe how she facilitates self-regulation in the classroom, Bev indicated that she uses a table of sensory items that students are taught to use as self-regulation tools:

> If we see what the kids need, then we say, "You know what, sometimes when I'm sitting for a long period of time, I like to wiggle a lot. I like to move a lot," and the weighted turtle would help somebody maybe to feel that they don't need to move as much and it actually relieves some of the anxiety that they're feeling, so we'd kind of provide those tools and they know that they're there. We talk about them a lot. They're like glasses, hearing aids, a wheelchair—they are a tool to help you, so you don't have to feel bad getting one. However, we monitor. We watch. It's pointing things out to them because they're not always aware of their emotions.

In her description, Bev described a cognitive approach to facilitating self-regulation by thinking about what we need to be able to focus on. She pointed out cognitive awareness of needs but did not explore how meeting these needs made the brain/body feel. She also used a cognitive lens to talk about emotions, stating that she helps students to problem solve their emotions throughout the day:

> When they are angry, upset, crying, [I] tell them, "I see that you're angry. What might help you right now?" Oh, you know, yes, [you're] angry, and that's okay that you're angry, but your friend or you are throwing sand and that's not okay. So, what can we do? It's pointing out their emotions to them so that they become aware when they're feeling a certain way.

A student throwing sand because they are angry suggests a state of high-stress allostatic overload, yet Maclean's (1985) findings suggested that in a high stress state, a students' fight/flight response becomes activated and processing questions in the prefrontal cortex may be inefficient. Bev responded to the student who was throwing sand by asking them a question when that child's stress level might have been too high to process linguistic information cognitively in that moment and made the assumption that the student had the resources to answer such a question. She focused on self-control rather than understanding the influences of stress on the brain. However, Bev's response showed an acceptance of all kinds of emotions and highlighted the importance of recognizing one's emotions which is part of neurophysiological self-regulation. Bev described an example of one student reframing another student's behaviour and helping him to regulate:

> I have one boy [who] was playing with the light switch, clicking it on and off, on and off. And this [other] boy in the class, he saw that he was doing that and that it wasn't safe. So, I was watching, and he said, "[Danny], instead of pulling on that, here, why don't you use this?", and he gave him a different tool at the self-regulation table. The kid did that on his own.

Her approach involved integrating knowledge with a shared classroom culture of taking care of one another in an inclusive way, and realizing that we can co-regulate one another through our actions as found by Schore (2012b) and expanded upon by Tantam (2018). She acknowledged that self-regulation is something that could happen spontaneously in moments throughout the day and not just during a planned lesson, in yet also indicated that it is formally limited to approximately 15 minutes of the school day. Bev might underestimate the way she integrates

self-regulation into her interactions because she indicated that students recognize body language in every interaction:

> If I roll my eyes at something, a kid picks up on that, and that's a stressor for some kids. They're in tune to that — crossing my arms, just how I'm standing. They pick up on that. So, we always reflect on that. Okay, what am I doing that might be adding to the stress? So, we do a lot of talking about it.

She understands that social engagement is not about what we say, but about how we say it, which is a physiological response to the social environment around us, where we perceive signs of safety or danger from nonverbal cues as found by Porges (2011) and expanded upon by Tantam (2018). Bev's reflections about these examples in her classroom reveal that she is a teacher who seeks moments throughout the day to work on relationships, empathy, and compassion for others and shows appreciation for individual sensory/biological needs, which aligns with neurophysiological definition of self-regulation. In contrast, she sometimes uses a self-control lens in expecting students to control their emotions and behaviours, and a learning strategies / self-control approach when relying on *Al's Pals* or *Zones of Regulation* to teach lessons on self-regulation.

In her interview, Bev mentioned that they use meditation in their classroom as a way for students to calm themselves. Meditation was observed in the classroom when she asked the students to sit before going outside. She modelled exactly how students should sit (legs at a 90-degree angle, backs straight), praising those who sat in this position. For about 30 seconds, children sat quietly, at which point, she rang the bell to end the meditation. She explained to the class about one particular student:

> I took you out of meditation because you were looking around. [Monica], you had your hands on your face. When we meditate, we don't touch our faces. You need to tell your mind to control your body.

Taking the children out of meditation as a group because one student had difficulty sitting still demonstrates that while she uses a neurophysiological tool (meditation), the tool is not individualized to meet the needs of each student. She reveals a self-control mindset in describing meditation as using the mind to control the body. Bev uses meditation as a reward and time-out from meditation as a consequence for not engaging in meditation "appropriately". Her example indicates that meditation may be used as a behaviour management strategy as opposed to a neurophysiological self-regulating strategy.

The classroom observation revealed that Bev integrated nonverbal communication by using a high amount of affect to make her instruction engaging and paced her group instruction to be interactive with movement, such as learning vocabulary by following directions to jump, clap, and dance. Furthermore, she acknowledged individual comfort levels by permitting students to express second language words to themselves if they were uncomfortable saying them out loud yet. Throughout interviews and observations, Bev was observed to use self-control approaches, learning strategy approaches, and aspects of neurophysiological frameworks, which is not unexpected given the range of professional development experiences in which Bev was involved.

5.3.4. Support for Facilitating Self-Regulation

In the interview, I asked Bev what relevant support she has received as an educator in learning about how to facilitate self-regulation. In response, Bev indicated that her 16 years of experience had allowed her, through trial and error, to reflect on what works well to facilitate

self-regulation. She also shared that the Learning Resource Teacher (LRT) had been a good resource:

> If we have any questions about anything, she's very good at finding us the tools that we need, and she'll teach us and let us know what we can do and how to use it. So, the special education department's been good if we need anything in providing us with the tools. We don't always know how to use them. It could be like the weighted turtle I've talked about, [or] squeeze balls. We've had a little windmill for kids to learn how to deep breathe in and out [and] the timer, [and] things like that.

Finally, she recognized the role of the ISET team (monthly In-School Education Team) where the principal, teachers, and Resource Teacher help educators break down where the stressors might be. There have been some valuable resources (a team approach, classroom consultants) that have supported Bev's facilitation of self-regulation in the classroom, but as she indicated earlier, she wishes there was more.

5.3.5. Needs and Barriers in Facilitating Self-Regulation

When asked in her interview what she felt she needed to better facilitate self-regulation in the classroom, Bev replied that she would like to see more workshops offered:

> It can't just be something that's given once a year [or] a couple of times in the year. It needs to be given and talked about because sometimes we think, "Oh yeah, we've touched on self-regulation" and then five years later, "Oh, maybe we should revisit that". At least twice a year, especially when you have a long-term teacher coming in, so if a workshop was given at the beginning of the year and the long-term teacher started after Christmas, she missed the workshop.

Bev also indicated that more release time would be beneficial to be able to connect with colleagues about events that are happening in the classroom. Overall, Bev described self-regulation in self-control terms, but her interview and my observations revealed that there are some ways (e.g., working on mindfulness, being responsive to nonverbal communication) when she facilitates self-regulation using a neurophysiological framework within the kindergarten classroom.

5.4. Ava

5.4.1. Demographics: Experience and Training

Ava completed her ECE training 12 years ago and began full time work as an ECE with the school board in 2014 in a kindergarten class with Bev. She was familiar with the main content and some details of the *Kindergarten Program* (Ontario Ministry of Education, 2016b), as well as the pre-packaged *Zones of Regulation* and the *Alert Program*. Ava noted in her interview that when she first started working in kindergarten, ECEs did not receive professional development from the school board because they were expected to remain in the classroom while teachers were out for professional development. As a result, she participated in the school board's required *Al's Pals* training but has received no other reported professional development training in self-regulation. She did participate in behavioural restraint training, noting that it was "not really self-regulation but when the self-regulation is not reachable, and they've already gone past that point, then that kind of training kicks in". Two years ago, she reported, the union started to advocate for more training:

> We started to push as a union to say that if our ECEs are expected to be with these kids and we're alone at times and we're still working with high-risk kids and the teachers want

> to be hands off, then we're the ones that need training. So, they started allowing us to take it.

Furthermore, she explained that Facebook groups had been more beneficial to her than the board training because it was more hands-on, like a support group:

> I'm on a few different kindergarten Facebook groups. There are a lot of them out there and they do touch a lot on self-regulation or people will put in there, "I have a child with autism — does anyone know of any interesting programs or apps I can download so I can help my students cope with the daily routine?", and they throw suggestions out so I do a lot of just trying to be part of these groups and involve myself in them and I find them really helpful, actually. It's more beneficial than what I get with the school board because these people are also hands-on in the schools and I find that that direction you're getting from the board is not always from people that are hands-on in the classroom, so what their picture is doesn't always fit what you have in the classroom.

Knowing that Ava's professional training in self-regulation was founded on familiarity with the *Kindergarten Program* (Ontario Ministry of Education, 2016b), *Al's Pals* training, and a CPL on Facebook, I next analyzed how she defined and described self-regulation to examine how that training impacted her thinking.

Ava's self-assessment on the self-regulation rubric (The MEHRIT Centre, 2017; Appendix I) revealed that she believes she has the ability to apply the reframe, reduce, and reflect on practices, but that her ability to recognize stressors and restore energy are only just emerging. However, it is unclear which stressors she is reducing when she is not confident in recognizing what the stressors are.

5.4.2. Definition of Self-Regulation (Research Question 1)

I asked Ava to define self-regulation in her interview. She responded that self-regulation is:

> … a child's way of being able to regulate in any kind of setting … it's not always when you're mad and frustrated but it's also when you're overly happy and excited and you have to find that equal medium of staying calm because a lot of times parents think self-regulation is negative, that it's negative all the time, but it's not, so you have to really be able to see that fine line where, okay, well yeah, they get angry. They get aggressive. They can kick, punch, whatever that they have, to be able to learn how to deal with their emotions. But then that also goes with feeling overly excited and overly happy and you still have to find a way to calm down.

She understands that big emotions can be positive as well, which reveals that she recognizes stressors in the emotion domain as an important part of the process of self-regulation. She also shows understanding of Shanker's biological domain when she indicated that teaching students' self-regulation also includes "regulating when they have to go to the washroom, regulating when they're hungry, when they're thirsty. You see kids — when they're anxious, they want to eat, so I think it goes beyond just behavior." She understands that something underlies behaviour that involves the biological and emotion domains and that these domains impact children's anxiety, and further, that educators need to tell students that it is ok to have feelings and what they should do to manage these feelings. In summary, Ava describes self-regulation in self-control terms, but also shows elements of beginning to reframe misbehaviour as stress behaviour and recognizing some of the biological and emotion-based stressors that can lead to dysregulation.

5.4.3. Facilitation of Self-Regulation (Research Question 2)

In her interview, Ava described how facilitation involves telling students the appropriate word for what the adult thinks they are feeling:

> They'll come to me and say, 'I'm sad', but then you can see that they're frustrated, so you try to say, "Okay, well it looks to me like you're frustrated. So why do you think you're feeling sad, because I see frustration?" So, I think [facilitating self-regulation means] teaching them the differences and using the words so that they understand the feeling with the word and then you're able to teach them the skills that they can use to regulate themselves because they don't know at that age. They know they're feeling something and it's off, but they don't necessarily know what word to use.

Ava assumes that she knows what the child's emotional state is, rather than accepting the emotional state that the child identified. She views the child's role as passive — that the child is expected to listen to what the educator is saying when the emotions are labeled for them, which aligns with a learning strategies approach. In a learning strategies approach, one tends to look for teachable moments. For example, Ava found a teachable moment when a student's parent told her, "He woke up in the middle of night and trashed his room, just trashed his room and I don't know why". Ava decided to use the dysregulation scenario of one child "trashing" his room as a whole class teachable moment and read a story to the entire group about cleaning one's room. She described, "We read the book to the whole class, but you could tell he was like, 'oh'. He knew that what he did was wrong." Conversely, in other situations, Ava showed her understanding that self-regulation is an individualized, in-the-moment process:

> A well-regulated student is able to sit and focus. When they can't, they're able to voice to you, 'I need to go for a walk' or 'Can I get a drink?'. They're able to identify when they

> need a break. And they can use their own strategies on how to cope with it, whether it's talking to you, whether it's going for a walk. We have one little guy who used to get up all the time, probably two or three times during carpet time, just for a drink, but we knew that was his way of regulating himself, so at no point did we say 'you can't do that'.

Furthermore, she indicated that being poorly regulated means that students do not necessarily read their own body signals of hunger or the need to use the washroom, and instead they wait for prompts from the educator, which further reveals her attention to the biological domain of self-regulation.

Ava reported that if students fidgeted during group instruction, they have a table of fidget tools that they can use as needed. Ava understands that people have varied sensory needs; however, she does not yet appear to consider which tools might help each child based on their needs nor help them to select individualized tools for themselves based on their specific needs. Throughout the interview, it was evident that while Ava does have a self-control definition of self-regulation and a learning strategies facilitation style, she also demonstrates elements of the neurophysiological Self-Regulation and Well-Being framework of the *Kindergarten Program* such as recognizing a child's biological need for movement to stay regulated.

5.4.4. Support for Facilitating Self-Regulation.

In the interview, I asked educators, "What relevant support do you receive as an educator in learning about how to facilitate self-regulation?" One of the highlights of Bev and Ava's classroom was the teamwork and social support that was apparent in both interviews. Their relationship with one another, having other kindergarten teachers in the school with whom to share resources, and having an exceptionally supportive principal were all noted as sources of

support. Ava stated, “The classroom teacher is a huge support for sure”, and noted that “our admin, like our principal this year, has been amazing.” Ava expanded:

> There are three adults in the room, and we all have to work together and [the classroom teacher] has been great, and our EA has been great. We actually text every day. We all get along really, really well, and we formed some really good friendships, too, but if you have the support of your principal and vice principal, that's huge.

Her reflection reveals that relationships and social engagement are really the foundation of self-regulation as found by Porges and Furman (2011) and expanded upon in theory by Shanker (2016) and Tantam, (2018). Her description highlights that the educators in the room may be well-regulated themselves as they co-regulate each other as well as co-regulate the students and model effective and connected relationships for their students.

Ava often facilitates self-regulation in the ways mandated by the *Kindergarten Program* (Ontario Ministry of Education, 2016b) such as talking to them about their feelings and using sensory materials to meet biological needs, but she indicated a desire to learn more. Therefore, I asked what might help her develop the ability to facilitate self-regulation more effectively. Her response is described in section 5.4.5., which examines educator needs and barriers.

5.4.5. Needs and Barriers in Facilitating Self-Regulation

Ava indicated in her interview that more up-to-date professional development was needed. She specified, “Not stuff that worked five, six, seven years ago, but what else is there out there now?” She went on to indicate, “I just wish we had more PD through our board to be able to facilitate that as a whole … I'd like to see more training on anxiety and children's mental health.” Her response highlights a desire to learn more about recent advances in neuroscience discussed in Chapter 2 that have changed the way we look at behaviour, self-regulation, and

mental health. Ava also mentioned that to support mental health, she would find it helpful to have a school counsellor visiting the classroom more often and providing advice for the teachers on what to do to support students, as he meets with students individually. She reported, “Everything is so confidential, but they don't always come back to us and tell us what happened in their meeting with the student, so we don't know what's going on”. Ava may be seeking more consultant support to provide step by step instructions, which might be interpreted as a stress response in Ava herself. However, a framework such as Shanker Self-Reg© does not tell educators what to do. A theoretical framework helps educators understand their own self-regulation so that, in turn, they can co-regulate their students who will eventually be able to self-regulate.

Ava also mentioned class size as a barrier to effectively facilitating self-regulation because of the number of individual needs that increase when class sizes are so large:

> Smaller class sizes would be ideal because just adding even five more bodies into that classroom with different needs, you really do try — you try so hard to form a special relationship with each one of these students and each one looks so different; their needs are all so different. In one day, I bet you, there's about 15 hats I put on because I'm trying to reach each student differently, whatever level they're at and with whatever needs that they have or they are lacking. It's a real juggling act, sometimes, but the smaller class size — oh my gosh. You can get so much more achieved and spend more one-on-one time with the students.

Her response about wanting to spend more one-to-one time with students to develop her connections with them relates back to the need to form strong attachment relationships with students as the foundation of self-regulation. She shows some understanding that it is not as

much about what you do as a whole class, but how you form individual relationships with each student that matters. Her training in *Al's Pals* has encouraged her to facilitate self-regulation lessons to the whole class as opposed to treating it as an individualized process; however, she also believes in the importance of social engagement and attachment as found by Porges (2013).

Overall, Ava's facilitation of self-regulation in the classroom occurs through calm, quiet modelling, responsive relationships, and prompting of an established routine that supports children's executive functioning (thinking, planning, and organizing), which is part of learning strategies (Effeney et al., 2013; Garner, 2009). There is some overlap here with reducing cognitive stress which is a practice that also aligns with Shanker Self-Reg, an individualized process of managing and responding to stress.

5.5. Classroom 5: Rosalie and Ophelia

5.5.1. Physical Environment

Rosalie and Ophelia's classroom was set up with rows of individual desks due to COVID, but Rosalie explained that typically, there is one central group instruction area with a carpet in front of the Smart Board with group tables for about 6 students each surrounding the group area, plus kidney shaped tables for teacher-directed literacy activities (Daily Five). Each wall was full of stimulating visuals and open shelves full of teaching and learning materials.

Figure 30

Rosalie and Ophelia's Classroom

The classroom climate was quite different from Bev and Ava's. Whereas Bev and Ava had a primarily engaged and calm classroom, Rosalie and Ophelia's classroom was observed to have more behaviour challenges, and Rosalie and Ophelia both seemed to be expending more energy as a result, with many reminders to students rto comply with class rules. The educators themselves noted in their interviews an array of behaviour challenges in their classroom this year including hitting, kicking, biting, elbowing, and throwing things across the room (including chairs). During the observations, the students did not appear to be well-regulated or engaged for much of the time, and I could sense tension among educators and students in the room throughout the observation. For example, while the teacher was distracted with setting up the Smart Board, the class escalated; there was more noise and chatting. The students were not responding to the educators' comments; instead, they were wiggling in their seats and appeared unfocused. In these moments, both Rosalie and Ophelia also appeared to become somewhat dysregulated. Their voices became higher pitched and their faces appeared flushed while they

struggled to manage behaviour using verbal reminders to get students to sit still and pay attention to the lessons. There were more regulated moments that occurred throughout the day, such as when students went outside for recess, when students and educators appeared more engaged and happier.

5.6. Rosalie

5.6.1. Demographics: Experience and Training

Rosalie has been a teacher for seven years. She participated in several self-regulation professional development (PD) opportunities, including a workshop on self-regulation on her own time, required in-school and board level PD (*Al's Pals* and *Zones of Regulation*), and a "strong focus on self-regulation" as part of her Kindergarten Part 1 Additional Qualification course for teachers. She reported being 'very familiar' with the *Kindergarten Program*, and 'familiar' with the *Zones of Regulation*, Shanker's *Self-Reg*, and *The Alert Program*.

When Rosalie completed the Self-Regulation Competencies Rubric during her interview (see Appendix I), she rated that her ability to recognize stressors *was developing*, but she felt more confident in her ability to reduce stressors, similar to other educators. Again, it is unknown what she is reducing if she feels less confident in her ability to recognize what those stressors are. She felt confident that her ability to reframe behaviour and restore energy were at the 'applying' level, and that she felt her skills at reflecting were 'extending' beyond application.

5.6.2. Definition of Self-Regulation (Research Question 1)

Rosalie defined self-regulation in her interview as "being able to manage your own body and understand the cues from others." Rosalie's definition of self-regulation is self-control oriented, but also contains elements of the neurophysiological components of how stressors can

impact stress behaviour such as body awareness and the use of neuroception, or the reading of social cues of threat or safety, as described by Porges within his theory (2013).

5.6.3. Facilitation of Self-Regulation

In contrast to her self-control definition, Rosalie's description of how she facilitates self-regulation in the classroom pointed to a learning strategies lens as well as self-control for the sake of learning:

> It's noticing and naming, and your body is out of control right now; you need to bring it down. And so, we started doing the *Zones* and adding that in. You're in the yellow or you're in the red, and then we need to bring you back to green, so that we can move forward, because right now you can't even play, you can't do your work, your friends don't want you beside them. For example, [one of my students] grabbed food out of their [peer's] lunches and just shoved it in his mouth, so we had to have him sit at a table by himself for a little while for him to watch more appropriate eating behaviours and table etiquette.

Her focus is on strategies that help a student control their behaviour to be in the "green zone", which is framed as the "right" state within a self-control approach. Furthermore, her behavioural approach of applying a consequence (having to sit by oneself) when a student demonstrates stress behaviour strays from a neurophysiological approach whereby the teacher asks *why* that behaviour is happening. The time-out consequence in this case was intended to help a student to learn social skills and etiquette throughout observation, which is also a learning strategy overlapping with social behaviour.

To further explore how Rosalie facilitated self-regulation within her classroom, I asked her if she had a plan or process for facilitating self-regulation in her classroom. She mentioned *Al's Pals* and *Zones of Regulation*:

> I have the visual charts in different spots of the classroom. I have some pictures also—a breathing strategy—one thing for *Al's Pals* is how to calm your body down, and it has a counting chart, a visual chart. There's the other one where you're breathing along the side of a hexagon, so breathing in, holding, breathing out. We have those placed in the cubby area. In the cubby area too, is 'How is my engine running?', and 'How do I get back to green?'

These visuals were prompts for teaching strategies, some of which, like breathing exercises, may overlap with neurophysiology, but they also imply that there is a "right" way to feel (such as being in the green zone). Similar to the cognitive approach taken in *Al's Pals* and *Zones*, Rosalie described a cognitive approach towards strategies:

> We've brainstormed as a class, so I have the chart of what they said for, 'What can I do?', and so if we see that somebody's not ready, we might ask them, "What colour are you feeling right now? How are you feeling? Okay, so if you're feeling tired or if you're feeling hyper, what do you think you need to do now to be ready to come back into class with your friends?"

Throughout her survey and interview, her responses indicated that she uses different lenses (self-control, learning strategies, and some elements of a neurophysiological framework) to facilitate self-regulation; however, neurophysiological approaches such as reframing a child's behaviour as stress behaviour and co-regulating to share her calm with students were not evident throughout my observation.

During the observation, students were disengaged for much of the first two hours of seated instruction and snack. Rosalie started the day with a Smart Board group lesson where students identified facial expressions—*talking about* self-regulation rather than actually *experiencing it* in the moment. While Rosalie appeared to put much energy into teaching in an animated manner, students increasingly demonstrated movement including tapping things, tipping their chairs, getting up and walking around, speaking out while the teacher and others were talking, and flapping their arms. After about 20 minutes, Rosalie told the class, "It's time to stop. We need to move our bodies", which demonstrates a neurophysiological observation in this moment. During a 2-minute movement video, one child refused to move, indicating that they needed a break from the movement video. Rosalie responded, "You don't need a break. You need to keep moving", rather than engaging with him about how he felt and what might help him personally in that moment. Rosalie shows here that she is the one who knows what is best for each student's self-regulation rather than providing them space to self-reflect on how their bodies feel and what they need individually to regain energy. Rosalie then quickly moved into the next lesson on the Smart Board without discussion or reflection on how students' bodies felt before or after the movement. These lessons, which can be contextualized within a learning strategies approach, require students to be seated for the first two hours of the school day which is commonly known not to be developmentally appropriate. During these lessons, Rosalie's focus was on compliant sitting and listening to the teacher-led lessons, which is a behaviourally-based self-control approach, rather than a reflective neurophysiological one.

5.6.4. Support for Facilitating Self-Regulation.

During the interview, I asked educators, "What relevant support do you receive as an educator in learning about how to facilitate self-regulation?" In response, Rosalie indicated the support of a behaviour coach:

> He would come in and observe some behaviours and then kind of help us develop our behaviour safety plans and action plans. He worked in a center [locally] for some time, and it was more of a treatment center, so his methods were a little bit more bold than what we have in class, but I could see how for some students they need that rigid structure, and it's not a slap in the face, but it's just basically like, 'No, that's not what we do here. Do what you need to do'.

Rosalie indicates an understanding that some structure can be useful for students with clear expectations but seems hesitant to use rigid behavioural strategies. In contrast, she noted that she really appreciated the professional development aligned with the *Kindergarten Program* (Ontario Ministry of Education, 2016b) that was part of her Kindergarten Additional Qualifications class, stating, "I really appreciate the PD that I did—the actual professional development for my kindergarten class was great with Stuart Shanker and EduGAINS. I like learning online." She did admit that "most of [the PD] that I've done, though, it has been on my own. I would like to see more of it," reiterating other educators' sentiments that more professional development in self-regulation is necessary.

Finally, Rosalie indicated an appreciation for the Education Assistant in the class because having different adults available for students facilitates different kinds of relationship development:

> I'm lucky that I have an EA in the class as well too, but sometimes I find there's certain students that connect with me better than they connect with some of the others, so we have a great arrangement in our classroom too, that it's okay if you know that one student connects better with that person. Let them go. We can cover everybody else, and they just need to take that time because they connect better, and if they connect better, then that student's going to be able to return to us ready to learn.

Rosalie shows an understanding that people have a neuroceptive sense of feeling safe with certain individuals, as Porges (2013) theorized, which also supports what Clinton (2020) says about students feeling *felt*. Rosalie recognizes that feeling safe is part of the relationship and that the focus in the classroom should not just be on overall behaviour control. Rosalie appreciates the supports provided and she also discussed in her interview the needs and barriers to educators' facilitating self-regulation within the classroom.

5.6.5. Needs and Barriers in Facilitating Self-Regulation

When I asked her about what supports and resources she felt she needed to better facilitate self-regulation in the classroom, Rosalie agreed with other educators that large class sizes made it very difficult for children to cope:

> I think that's one of the biggest challenges in kindergarten. They are so used to being at home, one on one with parents or a few siblings and then all of a sudden, they're in this environment. I had 26 in my class this year. I've had years where I've had 30 students. I find for some students, it's really difficult for them to navigate in that environment.

Rosalie's difficulty with large class sizes indicates that having so many people in the same room may be an added stressor for her as an educator across several domains (the biological aspect of visual/auditory stimulation, the cognitive aspect of monitoring the progress of so many students,

and the emotional and prosocial aspect of relationship development with so many students and limited time to share). Shanker (2016) suggests that a dysregulated educator has a diminished ability to co-regulate their students.

Overall, Rosalie describes self-regulation in self-control terms. She facilitates a classroom routine that is focused on cognitive group instruction through the use of multimedia teaching methods. She experiences (and perhaps models) stress herself when students are not fully engaged in lessons and tries to maintain compliance in order to calmly move forward with her instruction. She demonstrates a beginning understanding of the neurophysiological need for movement throughout the day and a desire to learn more about how to effectively facilitate self-regulation in her classroom. Her desire to continue supporting her students in the best way she knows how was evident in her advocacy for more training and support through participation in the current study.

5.7. Ophelia

5.7.1. Demographics: Experience and Training

Ophelia has been an Early Childhood Educator for seven years in a kindergarten classroom. She participated in the board-mandated *Al's Pals* training and had no other professional development in self-regulation as evident in her survey. Ophelia reported being very familiar with the *Kindergarten Program* (Ontario Ministry of Education, 2016b) and in her interview revealed that the only training she recalls about self-regulation was *Zones of Regulation*. During the interview, her self-assessment on the Shanker Self-Reg Competencies Rubric (The MEHRIT Centre, 2017) indicated a developing ability to reduce stressors, reflect on them, and to engage in personal self-regulation. She believes that she is able to apply the

practices of reframing, recognizing stressors, and reflecting on the self-regulation process with students, though these skills were not evident during the observation.

5.7.2. Definition of Self-Regulation

Ophelia defined self-regulation in her interview as "the ability to know how to control your body when you feel that inner craziness. Just to know how to calm yourself down." Furthermore, she described a well-regulated student in her interview as one who can "get their work done without being told," as opposed to the poorly regulated students who:

> …were the ones clustered together in the corner, hoping the teacher doesn't see them. They're just chatty. They just don't know how to occupy themselves, how to busy themselves, how to keep their emotions in check, all the while showing respect to the other people around them.

These comments indicate that some students may be exhibiting a fight or flight response (Cannon, 1939) to the environment by moving away from stressors with the hope of not being seen. She described that a well-regulated student pushes those maladaptive self-regulatory needs such as escape aside to get back to the work they were told to do. She describes self-regulation as control of one's emotions, body, and behaviour in order to occupy themselves and respect those around them. However, she does not acknowledge that some children might prefer quiet escape rather than keeping themselves busy in order to regulate their nervous systems and recover energy. For example, an educator might create a separate, quiet area of the classroom where students could block out the audio and visual stimulation of the classroom, such as a tent or quiet seating area where students are encouraged to use the space to reduce stress and individually restore. Well-regulated students will return to learning when they can (Greene, 2007). In the meantime, and perhaps with some scaffolding, they learn to be mindful and reflect on their own

self-regulation when they can feel their tension decreasing and energy increasing during this restorative time.

5.7.3. Facilitation of Self-Regulation

In her interview, Ophelia noted that self-regulation was really only planned to be done explicitly in the last few minutes of the day, noting that, "probably the end of our day or last period was mostly put [aside for] self-regulation, meditation, self-awareness, about 30-35 minutes when we start getting ready for home." She indicated in her interview that *Zones of Regulation* was used throughout the day as well:

> We have the posters up and it's spoken about a lot in the classroom. If you see a kid going up, [you ask] 'How do you feel? What colour do you think you are? What do we need to do to get you to the green? How are we going to do it?'

Her focus on the importance of being in the green zone implies the need for self-control in response to dysregulation, rather than the use of the zones as a potential neurophysiological tool for students to reflect on how they are feeling and how they got to that state. Leaving self-regulation facilitation for end-of-day lessons indicates a lack of understanding that self-regulation is not about something a person learns cognitively when they are about to go home, but instead is gained through lived experiences, co-regulated relationships, and brain-body connections as advanced by Shanker (2016).

Ophelia also described a calming down area which was not seen during the observation. She described the calming down area in her interview as follows:

> It is mainly in the hallway. But the problem with that in our classroom is our wall to the hallway is glass. So, it's like the kids are putting on a show and they know it. They bang

> on the windows, try and get everyone's attention to see the show that they're putting on in the hallway. This year has been a challenging one.

When I asked her about how the calming down area was used, she indicated that when a student appears dysregulated, the educator asks the student to go to the calm down area in the hallway with a sand timer (where the educator could see the student through the window). When they return, the educator asks, “Okay, how do you feel? Okay, you sound like you're ready to come back now.” In this case, the space is not used as an area for students to choose for energy restoration and tension reduction, but rather is a space that the adult uses as a behavioural consequence by promoting segregation from the classroom environment. When the child bangs on the wall for attention, it tells us that this child may be seeking social engagement, the foundation of self-regulation, but by excluding him, the educator does not just fail to meet his needs but actually increases the stress. Self-regulation happens through co-regulation and social engagement cues of safety (Clinton, 2020; Porges, 2009; Schore, 2012a; Shanker & Hopkins, 2019).

During the observation, Ophelia’s self-control definition and her focus on learning strategies and self-control in her facilitation approach were evident as well. When the breakfast cart arrived and a student began whining about not wanting to line up, she said to him, “If you want a yogurt, come line up. You are in control of your body.” Throughout the observation, she used behaviour management (control) strategies such as prompts like saying, “on your face or in your desk,” asking students, “What do I need you to do?”, and telling students to listen, to sit on their seats, and to use their words. These comments illustrate that Ophelia may be making the assumption that students always had conscious control over their behaviours—an assumption which is inherent in a self-control framework. Other behaviour management strategies she used

included praise and rewards for compliance and manners, such as, “Quiet body – that’s what I wanted to see!” She offered her attention as a reward to students when she said, “When you are ready, I will talk to you” and, “I need your body to be calm. When your body is calm, I’ll help you.” She neglects to use co-regulatory strategies (Clinton, 2014; Tantam, 2018), and instead will only help students when they are calm, rather than when they are dysregulated and need her help the most. These behavioural strategies were supported by her indicating that students were misbehaving intentionally (rather than responding with stress behaviour), such as when she asked one student, “Can you pick up the garbage that you’re purposely standing on?” She withdrew her connection with students as a behaviour consequence when they exhibited stress behaviours, such as when she said to one student, “You were screaming, and I turned my ears off when I hear screaming”. If screaming was interpreted as a stress behaviour, perhaps Ophelia may have responded with empathy and social connection, rather than withholding that social connection that would have allowed her to co-regulate, and eventually, through socially engaged interactions like this, have the student learn that they can self-regulate. Ophelia’s self-control mindset was evident in these behaviour management strategies intended to elicit self-control that she used in an attempt to maintain order and calm in the classroom and which she believed would create an optimal learning environment.

5.7.4. Support for Facilitating Self-Regulation

I asked Ophelia during the interview what supports she has found helpful in her facilitation of self-regulation. She replied as follows:

> That's a tricky one. We have two and a half EAs in our classroom because of the craziness in our classroom to help the children to self-regulate; to have someone right

> beside the ones that are highly volatile, to give them that little nudge. So, there's, at most times, five adults in the classroom to help with those behaviours.

She appreciates the extra hands in the room to support behaviour management but misses the community of practice meetings that were recently eliminated by the board for unknown reasons.

5.7.5. Needs and Barriers in Facilitating Self-Regulation

In addition to her noted concerns with behaviour challenges within the classroom, Ophelia also expressed that she hoped for more professional development about individualizing the self-regulation process:

> I think learning different ways, because not all kids respond to the same thing. If I say to one kid, “How is your engine running?”, I'm probably going to get a shoe thrown at me. When I say something like that to another kid, that would be the perfect thing to say. So, having different items in your toolkit definitely helps—especially now, because it is mostly coming from home and for different reasons.

From the way Ophelia describes the student behaviours she was seeing in the classroom, it seems that she may have been experiencing some dysregulation herself and does not necessarily feel safe and connected in her relationships with her students, which can impede the process of self-regulation for staff and students alike (Porges, 2013). She notes that implementing one specific program, such as the Alert Program, will not be effective for her whole classroom without some modification and individualization. Understanding the need for individualization is aligned with the Shanker Self-Reg© focus on individual needs as opposed to the overarching use of a scripted program for the whole class as part of a dynamic rather than linear system.

5.8. Summary of Case Studies

Overall, the case studies demonstrated that educators were still conceptualizing self-regulation as equivalent to self-control which impedes the embodiment of a neurophysiological framework for understanding and facilitating self-regulation in the classroom. Educators want students to control their thoughts and behaviours and are trying to teach them strategies to calm themselves down so that they can engage with learning which was evident in various examples (e.g., telling them to calm their bodies down, using meditation to gain control of their bodies) in both of these kindergarten classrooms. Elements of both self-control and neurophysiological understanding were documented through interviews and observations, but self-control was the most evident as educators employed behaviour management techniques to encourage students to control their behaviour and emotion. Perhaps board-wide training on programs like *Al's Pals* and *Zones of Regulation* which do employ a self-control lens influenced educator understanding of self-regulation as self-control.

The students in both classrooms were quite different in terms of their self-regulation. In Classroom 1a (Bev and Ava), where student relationships are prioritized, some individualization of seating and other needs was included, and restorative practices like meditation, play-based learning, and regular movement were included in the routine. This classroom demonstrated implementation of the highest number of *Kindergarten Program* recommendations. Students were listened to, and educators tried to help them reflect on how they were feeling, helping students to feel heard and felt. As a result, students remained on task, followed instructions with ease, and participated actively in the play-based learning activities available to them, making some of their own choices with regards to activities and socially engaging with their peers and educators. This kind of environment, including the relationships, is the kind that needs to be

expanded upon in self-regulation to further help support students in developing the ability to recognize their own stressors, reduce them, reflect upon them, and respond to them per Shanker's theory (2016).

In contrast, in Classroom 5 (Rosalie and Ophelia), there was less individualized connection with students, who remain seated in desks and were expected to attend to a cognitively based group lesson on the SmartBoard for 2 hours. Students were disengaged, wiggling, off-task, and perhaps just trying to regulate themselves within stressful physical and cognitive expectations. There were few relationship-based interactions or examples of co-regulation observed (indeed, the educators appeared stressed themselves with strained voices and social disengagement), and most of the classroom interactions were more about behaviour management, instructing students to attend to the teacher's lesson rather than connecting and helping students to feel *felt*. The learning environment for the first two hours was more like a typical teacher-led classroom using screen time to try to engage students, rather than the play-based classroom mandated by the *Kindergarten Program* (Ontario Ministry of Education, 2016) where learning is inquiry-based rather than knowledge-based lessons. In this classroom, the educators seemed stressed, spending much of their time trying to gain student compliance with sitting still at their desks, and students did not appear to be regulated, trying to move within the boundaries of their chairs. This was not an environment conducive to learning across the four frames of the *Kindergarten Program* and was challenging for educators and students alike.

What the *Kindergarten Program* (Ontario Ministry of Education, 2016b) asks educators to do is to focus on the individual relationships and interactions with students throughout the day to help them learn to self-regulate through effective co-regulation, not from cognitive knowledge of what people can and should do to calm themselves down. Self-regulation involves the whole

body and is so much more than just a cognitive knowledge base (Clinton, 2020; Shanker, 2016). Educators have been provided with a variety of tools and resources, like behaviour consultants, mental health consultants, *Zones of Regulation* resources, and *Al's Pals* training, which have resulted in educators trying to teach strategies for calming down, often through scripted lessons about naming feelings. These cognitively based lessons are only one very small part of facilitating self-regulation.

Overall, educators are seeking more professional development but agree that it needs to be delivered in a different way that focuses on individual student needs—practical approaches from professionals who understand what it is like in a large classroom with so many programs and expectations to fulfill. Educators want to improve their ability to facilitate self-regulation in the classroom, but perhaps need more training and resources that align with the *Kindergarten Program*'s neurophysiological framework of self-regulation in order to do so effectively.

Chapter 6: Discussion

The findings of this study indicate that educators largely hold a self-control understanding of self-regulation and use a learning strategies framework to teach self-regulation to their students, as opposed to the neurophysiological framework included in the Ontario *Kindergarten Program* (Ontario Ministry of Education, 2016b). Facilitation was typically comprised of pre-planned group lessons, a cognitive learning strategies approach, focused on remembering what you should do in order to feel calm and control your behaviour and emotions (i.e., self-control). There were also key moments where educators demonstrated use of a neurophysiological framework of self-regulation. This chapter explores the results of the current study within the context of the self-regulation literature, highlights the implications of the findings, discusses limitations, and suggests some practices that may help educators to align their understanding and facilitation of self-regulation with the Kindergarten Program.

6.1. Research Question 1: How Kindergarten Educators Define and Describe Self-Regulation

6.1.1. Confirmatory Findings

Surveys and interviews revealed that educators perceive self-regulation as equivalent to self-control. Educators described the role of the student in developing their own self-regulation as complying with the strategies educators have taught them, including *Al's Pals* strategies for taking turns, sharing, and handling anger by choosing to "stop and think about what to do so we don't get in trouble" (Wingspan, 2004). Educators' self-control mindsets are not a surprise, given that behaviourism (i.e., behaviour control) had been a common approach to self-regulation in the 1950s and 1960s (Post et al., 2009), and Burner (2018) found through a review of education change literature, that attempts at change since the 1960s have been unsuccessful. These findings

support the fact that educators perceive self-regulation similar to a muscle to be trained in order to gain strength in controlling one's emotions and behaviours (i.e., willpower) as described by Muraven and Baumeister (2000) and Vohs and Baumeister (2016).

The learning expectations of the *Kindergarten Program* (Ontario Ministry of Education, 2016b) include some self-control components such as accepting help to calm down, calming themselves down after being upset, and adapting behaviour to different contexts such as following rules in different areas of the school. However, these components represent only three of the 34 expectations of the Self-Regulation and Well-Being frame (SRWB; see Appendix J). Other expectations include nonverbal interactions, empathy, solving problems within social situations, and demonstrating through play what makes students happy and unhappy and why. It may be helpful for educators to revisit the learning expectations of the SRWB frame in order to prioritize what is important overall for self-regulation in kindergarten.

6.2. Research Question 2: How Kindergarten Educators Facilitate the Self-Regulation Process in Their Classrooms

6.2.1. New Insights

The following section outlines new insights that emerged from the findings.

6.2.1.1. Theme: Observed Neurophysiological Practices. The findings of this study suggest that these educators do engage in some of the Ministry recommendations for creating a regulating environment and facilitating the development of self-regulation in their classrooms. A detailed list of what they have been doing can be seen in Appendix K, but in summary, some of the following practices were observed: use of alternative seating, sensory materials offered as tools, meditation to adjust arousal levels, and maintaining a calm demeanor when interacting with students about their feelings. Educators encouraged problem solving outside of group

instruction and modeled empathy and kindness in conflict situations. They were aware of some of the essential components of neurophysiological self-regulation (experience-based learning, empathy, and relationships) but were not using the totality of the recommended framework overall in their facilitation of self-regulation.

6.2.1.2. Theme: Self-Regulation Facilitated as a Learning Strategy. It was expected that since educators define and describe self-regulation as self-control, that this would be the way that they facilitate it in their classrooms. In contrast, across all data collection methods, most educators (26 of 29 educators) reference a primarily learning strategies style of facilitation. Educators in the current study demonstrated 17% of the physical environment recommendations, 20% of facilitation recommendations, and 34% of relationship-based recommendations included on the SCEIC observation checklist, which indicates that educators are using some of the Ministry's Self-Regulation and Well-Being recommendations. Educators report behaviour challenges in their classrooms and try to manage these stress behaviours by focusing on compliance (e.g., reminders to sit down, praise for compliance with classroom rules). When educators ask students to stop and think before reacting, they may be assuming that stress behaviour is under conscious control (a self-control mindset) rather than a quick unconscious limbic reaction (a neurophysiological mindset). It is known that teacher's understanding of why behaviour is happening can impact their willingness to adopt recommended interventions (Andreou & Rapti, 2010; Bibou-Nakou et al., 2000). Moreover, educators who believe that behaviour is under a child's control may be less likely to believe in successful intervention outcomes (Reyna & Weiner, 2001).

In response, educators teach students to name their feelings without referencing arousal levels or reflecting on what impacts the way they feel. They place demands on children to

participate in activities (when they withdraw from the group) without considering their self-regulatory state or needs. Overall, educators are trying to teach students (and expecting them to learn) cognitive strategies aimed at controlling their emotions and behaviours that are part of the *Al's Pals* and *Zones of Regulation* curricula mandated by the board. It may be that educators are trained to think about learning using a very cognitive lens and may be overgeneralizing this cognitive lens to self-regulation and well-being.

6.2.1.3. Theme: The Problems with Programs. Educators here facilitated self-regulation through scripted lessons rather than through play-based learning experiences (safe, mutual social engagement and inquiry with educators and peers) as originally intended in the curriculum. The use of scripted programs is in conflict with self-regulation as outlined in the *Kindergarten Program*. *The Kindergarten Program* (Ontario Ministry of Education, 2016b) recommends a neurophysiological approach where educators who understand and *reframe* behaviour as stress behaviour to help students by *recognizing* the stressors in the classroom, *reducing* them as much as possible, *reflecting* with each student on their own process of regulation, and supporting students in developing their own adaptive and individualized ways of *responding* to stressors to maintain balance throughout the day (Shanker, 2016).

Scripted, pre-packaged programs *can* be useful for teaching certain skills. For example, Pandey et al. (2018) found that self-regulation programs (from 1977-2017) were effective for outcomes such as academic achievement, social skills, mental well-being, behaviour problems, conduct disorders, school suspensions, and substance abuse. However, these outcomes are more closely related to self-control than self-regulation. Shanker (2016) contends that self-regulation makes self-control possible, and in many cases, unnecessary.

Additionally, educators report some frustration at having to include yet another program in the play-based curriculum. In her interview, Sofia mentioned the need to reduce the number of mandated programs in order to increase class time spent on relationships and experiences:

> Time in the day would be something. You're always trying to squeeze in lessons and especially at this age, sometimes I have to remember that no, they just need to play. You can't be doing lesson, lesson, lesson, so that sometimes having all of those different programs is a barrier, because you need the guidance of them, but then you're worried about getting all of those in.

Sofia's comment suggests that perhaps she understands that self-regulation is about social engagement and learned through play-based experiences as mandated by the *Kindergarten Program* but that educators are expected to facilitate self-regulation in a different kind of way through cognitively based lessons as per the board's direction. Fay agreed, reporting that the resources educators are given to help them learn more about self-regulation may be useful (such as a handout adapted from the Alert Program; Williams & Shellenberger, 1996), but that their day is so full with expectations to meet curriculum guidelines, manage behaviour, and complete incident reports that they do not have time to read them. Expecting educators to implement yet another program in their day paradoxically causes educator stress, and researchers suggest that dysregulated educators will be less able to co-regulate their students, which is an important part of the process in developing self-regulation (Porges, 2015; Schore, 2012a; Tantam, 2018). Furthermore, when young children are developing self-regulation, a focus on self-control can impede progress by creating additional stressors rather than reducing them. As Shanker (2016) suggests, based on Porges's (2013) research, sometimes compliance or apparent self-control may even be a sign of dissociation, a reactive state that is harmful to mental well-being. Programs,

then, can actually cause stress on the educator and student which impedes the neurophysiological self-regulation progress.

Although pre-packaged programs may seem like a quick and simple solution to integrating self-regulation into the curriculum, the self-regulation process is much more dynamic and complex, and these programs may be too structured in format to be able to support children in their own individual and developmental processes of self-regulation as defined by Shanker (2010) and the Ontario Ministry of Education (2015).

6.2.1.4. Theme: Class Size Stress. Several educators (one teacher and five ECEs) indicated that class sizes are so large that educators are having difficulty reducing stressors in the environment and connecting with each student to develop safe and secure relationships, a phenomenon discussed in Chapter 5. Many educators are spending time trying to monitor and manage behaviour to keep children seated and quiet in order to maintain a semblance of calm in the classroom so students can learn. However, this assumes that children need to be seated and quiet in order to learn, which is not necessarily the case, especially within a play-based program where children are intended to be moving most of the day rather than being seated. Furthermore, putting all one's energy and effort into controlling one's movement to remain still and compliant could potentially impede a student's ability to focus on the lesson being delivered. The need to manage behaviour could be related to class size. Free play with thirty or more children may seem like a chaotic environment that creates unneeded stress across domains on educators and students alike, impeding the self-regulation process. However, a more interactive, play-based environment is what the *Kindergarten Program* advocates that children need in order to learn at this developmental level.

6.2.1.5. Theme: Consultants and Consistent Mindsets. Educators appreciate the specialists who come to the classroom to consult for specific children including behaviour specialists and special education consultants. However, behaviour specialists look at specific behaviours and how to change them using prompts and consequences. They are focused on rigid safety plans for individual students with the highest needs, whereas there are also learning and developmental needs identified across all students. Using reactive safety plans is not a proactive approach intended to prevent stress behaviours as is recommended in the Early Years reports. The use of reactive safety plans is misaligned with the Kindergarten Program's recommendations to proactively create calm and engaging environments and may serve as a hidden stressor for educators trying to navigate best practices in supporting children's self-regulation and well-being when advice is coming from consultants who have different lenses on behaviour.

6.2.1.6. Theme: Home-School Consistency. Educators see the lack of consistency between home and school in targeting self-regulation. They express frustration because parents are doing everything for their children rather than letting them do things for themselves. Educators want to see parents using the teaching strategies that they are using in the classroom, such as "stop and think" before acting, when the students go home. Their frustration suggests that educators may believe that self-regulation is a skill-based construct that begins in the school and then needs to be taught similarly in the home, rather than the other way around. A neurophysiological framework points to social engagement as the most important aspect in the development of self-regulation and well-being—not the teaching of skills. Researchers suggest that self-regulation begins in the home with early attachment relationships (Diamond et al., 2012; Porges, 2011; Schore, 2012a) that should be built on in the school, and not typically the other way around.

6.2.1.7. Theme: Screen Time Stress. The case studies presented in Chapter 5 illustrate the potential impact of screen time. Rosalie and Ophelia use the SmartBoard to try to capture students' attention. However, after the use of the SmartBoard for videos, movement activities, and visually based lessons, students may be trying to self-regulate through movement and attention to different areas of the classroom, causing their lack of focus on the teacher and each other. In contrast, in Bev and Ava's classroom, students do not have any access to screens, and appear more engaged with the environment and people around them. The students follow the classroom routine with more ease. Greene (2007) and Carney and Parr (2014) suggest that screen time can be a stressor for children, and Shanker (2016)'s framework of self-regulation emphasizes the need to recognize and reduce such stressors. Perhaps the use of the screen detracted from the educators' ability to connect with each student individually and form relationships, an important part of self-regulation facilitation (Clinton, 2020; Schore, 2012a; Tantam, 2018) where social engagement provides the cues of safety (Porges, 2013). Perhaps the use of the SmartBoard also serves as a stressor for students. Dunckley (2015) reports that screen time disrupts sleep and overloads the sensory system. Screen time is also known to induce stress reactions (Sharma et al., 2006), and increase cortisol, a stress hormone, which then reduces attentional focus (Skosnik et al., 2000). Lastly, perhaps the overuse of the SmartBoard for teaching is a sign of educator stress, which, as Porges' (2013) research suggests, may diminish their capacity to socially engage with their students due to their own stress. When educators are not socially engaged, they may be unable to connect with and co-regulate their students (Tantam, 2018). The use of screen time and educational technology and their impact on stress and self-regulation would be an interesting area to explore further in future research.

6.2.2. Summary

Kindergarten educators use a learning strategies approach to teach their students behavioural strategies for controlling their emotions and behaviours, which is likely a result of using the programs mandated by the board. Unfortunately, these programs are misunderstood and may be causing more stress than less. Educators may be using programs as a quick fix because they do not have any other options and have little time and energy to devote to deeper professional development in self-regulation. Educators are experiencing stress, including the need to use programs, to work with large class sizes, and to manage disruptive stress behaviours in the classroom.

6.3. Research Question 3: Connections Between Educator Understanding of Self-regulation in the Classroom and: Educator Experience, Role (teacher or ECE), or Professional Development Experience

6.3.1. New Insights

The following section describes emerging themes in the potential influences of educators' experience, role, and professional development on how they understand and facilitate self-regulation in their classrooms.

6.3.1.1. Theme: Professional Development Needs Improvement. Neither experience nor professional development impacts the definition that educators adopt, since all educators unanimously use a self-control definition to guide their practice. None of these factors seemed to impact practice either, with 79% of educators employing a primarily learning strategies facilitation style.

There is low familiarity overall with the resources that align with a neurophysiological framework of self-regulation, with most educators reporting having never heard of or knowing

nothing about the Early Years Studies, Shanker's *Calm, Alert, and Learning* (2012) and *Self-Reg* (2016), *The Explosive Child* (Greene, 2007), and Mona Delahooke's *Social and Emotional Development* (2017) and *Beyond Behaviours* (2019). Each of these resources aligns with a neurophysiological framework of self-regulation. In contrast, 24 of 29 educators are familiar with *Zones of Regulation* (Kuypers, 2011), which is instead focused on self-control.

Those adopting a self-control facilitation style (n=2) are the least familiar with each resource. Autumn, the only participant describing a predominantly Ministry-recommended facilitation style in the survey, is also the participant most familiar with each resource. It is unfortunate that this educator did not agree to participate in the interview and observations and instead only completed the survey since this case may have shed some insight on the impact of a broader range of experience and professional development.

In terms of observed practices, Eliza, the educator with the most years of experience of the 12 educators interviewed and observed, was the lowest scoring educator on the SCEIC which signifies that more experience in teaching kindergarten does not necessarily relate to better facilitation of self-regulation in the classroom. Also noteworthy is that Bev, the educator with the highest overall SCEIC score, has the least professional development experience, only having attended a 2-3-hour workshop on her own time and not having participated in any board training on self-regulation. In contrast, Rosalie, the lowest scoring educator on the SCEIC, has the most professional development experience, having attended conferences as well as required school and board-level professional development and a completed Kindergarten Additional Qualification (AQ) course with a self-regulation focus in her seven years of experience.

Overall, these findings suggest that the less familiar educators are with the Ministry's kindergarten-relevant resources (e.g., the Early Years Studies, Shanker Self-Reg, EduGAINS),

the more likely they are to use a self-control mindset, and the more familiar they are with these resources, the more likely they are to use a neurophysiological mindset. These results, however, are based on a very small sample size and should be examined within the context of a larger sample in the future.

The training provided to educators is not aligned with the Ministry-recommended practices of the *Kindergarten Program*, but rather the opposite. *Al's Pals* is the only professional development training that all educators have partaken in, so it is not surprising that educators think of self-regulation in self-control terms and facilitate it through a learning strategies approach because as per its manual, *Al's Pals* is a lesson-based program that is couched in self-control (Wingspan, 2004). Educators place their trust in the board and consultants to provide evidence-based practices, but the programs provided lack the evidence base one would expect, and consultants have provided recommendations couched in a potentially outdated behavioural framework rather than contemporary understandings of self-regulation.

How has existing training impacted practice? Ophelia and Amelie reported having had behaviour-based training to support their ability to facilitate self-regulation and feel that they need more training in behaviour management. Perhaps the behaviour-based training did not solve the problem of stress behaviours in the classroom. Ophelia's facilitation style (learning styles category) includes many behaviour management components such as: demands to sit still during group instruction, praise, being rewarded for compliance by leaving first for breaks, warnings that students would have time-outs when not being focused on group instruction and explaining the need for a quiet body when a student was distressed. These behavioural techniques don't seem to be effective at supporting student self-regulation, because students are not complying with what they are being asked to do—to sit and attend to the teacher's lessons. It seems that

educators who are focused on behaviour management and self-control rather than neurophysiological self-regulation are also those who are seeking more help in controlling behaviours.

What do educators need in order to improve their understanding and facilitation of self-regulation? Educators themselves expressed a need for a different kind of professional development (PD) to help them. Educators (three teacher and five ECEs) stated that they wanted more PD for teacher / ECE teams. Some mentioned having had behavioural training but they were looking for more training specific to self-regulation. Amelie and Sofia indicated that their professional development training has focused more on academics than behaviours. Ophelia noted that training was needed in different ways to facilitate self-regulation, because not all students respond to the same things. Several educators suggested a more hands-on approach to see what self-regulation could look like in a classroom according to the *Kindergarten Program*. Ultimately, an educator can implement any program, but if they are not regulated themselves (which is what Shanker Self-Reg (2016) helps educators to do), they will have difficulty understanding and implementing any program and seeing positive student outcomes. This difficulty is not a criticism of the self-regulation programs but instead is the result of jumping to Shanker's fifth step (*restore*) too soon. Educator understanding of the Shanker Self-Reg framework (2016) before implementing any program could help teachers work on their own self-regulation, which in turn could help them facilitate a program geared towards self-regulation. Further research into student behaviour outcomes as a result of educator philosophy towards stress behaviour would be advantageous.

6.3.1.2. Theme: Teacher and ECE Differences. Interestingly, interviews showed that teachers (as opposed to ECEs) see the role of the educator as teaching awareness of feelings and

teaching self-control strategies, often in order to be ready to learn. Conversely, ECEs tend to see the role more as supporting their students' families, making students accountable for their own behaviour, listening to them, and letting them know that their feelings are okay. Teachers take on more of a learning strategies approach, whereas ECEs focus more on an accepting and respectful student-teacher relationship which was also described in their interviews. ECEs had higher scores on the relationship section of the SCEIC than did teachers. Perhaps training provided to ECEs during their preservice program was more aligned with a neurophysiological lens for understanding self-regulation, which itself is founded in relationships and social engagement (Porges, 2013). For more context, I contacted the local college (name withheld for confidentiality) where ECEs may have been trained and discovered that Shanker Self-Reg© was indeed a part of the local ECE curriculum (L. Connolly-Beatty, personal communication, December 8, 2020). The curriculum includes a 2-hour introductory workshop for students about self-regulation using a neurodevelopmental framework that includes Shanker Self-Reg, and a presentation developed by a local Self-Reg Community of Practice with support from The MEHRIT Centre that is used during the program. Following the workshops, students read Shanker's *Self-Reg* (2016) and work through a discussion guide, answering questions for each chapter and discussing responses in class. In addition, students choose one child in their placements to reflect on the self-reg principles related to that child throughout the semester.

Although this particular curriculum could only have been introduced in the last five years since *Self-Reg's* (Shanker, 2016) publication, participants would have taken their pre-service training prior to this. Perhaps ECEs acquired some of these contemporary mindsets of local ECE faculty that are founded on relationship development and social engagement as the basis for early childhood development (Best Start Expert Panel on Early Learning, 2007; Greenspan, 2007;

Porges, 2009; Shonkoff & Phillips, 2000). Furthermore, participants did not specify where they engaged in their pre-service training, though in a small northern community it is assumed that many would have engaged in this training locally. Perhaps ECE training is more play-based and relationship-based, and teacher training is more focused on behaviour-based learning paradigms. Future research examining the philosophical differences among teacher and ECE training would be interesting.

6.3.1.3. Theme: Self-Assessment Rubrics—Where Support is Needed. To determine how educators feel about their implementation of a neurophysiological framework, I analyzed results of educators' self-assessments on the Shanker Self-Reg Competencies Rubric (The MEHRIT Centre, 2017; Appendix I) for each of the five practices of the Shanker Self-Reg© process (Reframe, Recognize, Reduce, Reflect, Restore). Interestingly, the self-assessment scores suggest that educators feel more confident in reducing classroom stressors than they do recognizing them, which makes one wonder what they are reducing if they do not recognize the stressors. It may be effective to include training in each of the five practices (steps) of Shanker Self-Reg, including developing skills in recognizing hidden stressors, to ameliorate the process of facilitating self-regulation in the classroom using all five practices.

6.3.1.4. Theme: Classroom Relationships (Team Development Needs). An important relationship-based theme that emerged as a need was the importance of a team approach in kindergarten classrooms. Eleven of the twelve educators interviewed mentioned the desire to be able to spend more time together as a cohesive team to share ideas and support one another. Three ECEs mentioned that one of the things that they found most supportive in their ability to facilitate self-regulation was the development of relationships with their teaching partner. Educators in the school with multiple kindergarten classrooms remarked that it was a tremendous

support to be able to share ideas with other kindergarten educators. One insightful ECE commented that these relationships were important not just for mutual support, but because in the classroom climate, students pick up on those relationships between teachers and ECEs. Within this school, Bev and Ava have worked well together for several years and both remarked at the supportive nature of having developed a good working relationship with each other, which was reflected in their higher SCEIC scores, including their ability to develop relationships with their students. In contrast, Fay and Eve also work in the same school, but have not worked together as long as Bev and Ava have. Fay and Eve experienced some challenges in how they work together, and despite having experienced the same training as Bev and Ava, their SCEIC results were not as high; they didn't facilitate as many of the Ministry recommendations as did Bev and Ava. Teamwork was shown to be an important aspect of educators' ability to facilitate self-regulation in the classroom, not only to model healthy and supportive relationships, but also to mutually support one another to reduce each other's stress through co-regulation and Tantam's (2016) concept of the interbrain. Educators could potentially co-regulate as part of a teaching team through debriefing, venting, and expressing empathy towards one another and the sharing of resources and ideas.

6.3.2. Summary

Educators' responses indicate that professional development needs improvement. They indicate a need for a more hands-on, consistent approach, and a need for more training specific to self-regulation. There is a potential need for teachers and ECEs to be trained in consistent approaches as there may be differences in the philosophies that were used in their respective pre-service training such as those that emerged in the current study. Educator self-assessments revealed a potential need to focus on each of the five steps/principles of the Shanker Self-Reg

framework in order to align educator self-regulation practices with the *Kindergarten Program's* SRWB frame. Assessments also showed a need to include personal self-regulation as a starting point, so that educators are able to co-regulate effectively with their students, an aspect which Shanker (2016), Clinton (2020), and Tantam (2013) contend is critical to the process of self-regulation.

6.4. Limitations and Future Research

The current study's results should be interpreted within the context of their limitations as described in the following sections.

6.4.1. Impact of COVID-19 on the classroom environment and practices

Educating students in the midst of a pandemic led to many challenges for educators and for this research. When schools were closed due to the pandemic, educators and students had to very quickly pivot to an entirely new way of teaching and learning—namely online which caused stress across domains for educators and students. There is biological stress from having less movement and spending more time in front of screens as teachers provide lessons through online videos. Emotional stress has also surfaced from fear about what might happen in a pandemic. Cognitive stress is impacting families because they are maintaining a busy schedule of working and supporting home-based learning while trying to make ends meet. Social stress has also impacted families because they are unable to connect face-to-face and instead have to communicate in online with teachers. The prosocial stressors are evident as everyone shares their own personal stressors with those around them. When classrooms were reopened in the fall, Kindergarten educators were asked to set up classroom environments where students could maintain physical distance between them. Several educators (i.e., Rosalie and Ophelia) chose rows of desks rather than group play areas. Soft surfaces (that were likely the previous comfort

areas of the classroom like soft seating and rugs) were not permitted. One potential benefit was that walls were required to be almost empty, with only the bare essentials posted which may actually be beneficial as busy classroom walls can be overstimulating, making it difficult to know where to focus one's attention (Barrett et al., 2013). These public health requirements meant that classrooms that were observed for this research study were certainly not representative of the typical classroom environment.

Although the classrooms were physically impacted, the stressors of teaching during a pandemic undoubtedly impacted teacher practice as well. As discussed earlier, educators need to be well regulated themselves in order to co-regulate others so that they can develop their own self-regulatory capacities. Play-based learning became a challenge because of the need for physical distancing, and the use of nonverbal cues became challenging because everyone needed to wear masks covering their faces.

In terms of data collection for the current study, several educators moved to online teaching roles after being interviewed and therefore I did not have the opportunity to observe these classes. Online teaching of kindergarten would be an interesting area for future study, as kindergarten is mandated to be play-based, and it is unclear how play-based learning and interactions can occur in an online kindergarten learning environment. Furthermore, Communications of Learning were not necessarily as informative as they could have been, because educators were required to comment only on student progress that occurred prior to the school closures in March, so there was limited data emerging from them.

6.4.2. Measurement and Data Collection

This study's findings must be considered in the context of its limitations including history and maturation effects. Educators may have engaged in reading about self-regulation between

the beginning of data collection (survey) in September 2019 and the classroom observations in October 2020 or may have developed closer relationships with their students and this potential learning was not accounted for in the current study. Additionally, none of this learning or relationship development was reported in interviews occurring in July 2020 and was indeed unlikely due to disruptions of the pandemic and online instruction.

There were also threats to the internal validity of the data collection tools developed (the semi-structured interview and SCEIC) as well as limits of generalizability. Summers (1969) describes respondent bias as inaccurate participant responses, whether intentional or not, including the following:

> Visual cues of the investigator: In the current study's face-to-face interviews and observations, the investigator's facial cues could have impacted responses based on the investigator's philosophical bias.
>
> Identifiability of respondent: Interview and observation respondents were identifiable. I was known to some of them through previous but distant professional relationships which could have impacted educators who may have wanted to present their teaching practices in a positive light.
>
> Nature of the content: Participants may have felt inclined to respond in the way they thought the investigator would approve of or agree with.

Respondents may have also responded in ways that they perceived as socially desirable or in ways to please or help the researcher (Furnham, 1986).

The SCEIC may not be broad enough to represent self-regulation fully, and further future consultation with experts in the field as well as expanded research using a larger sample size than the current sample of 29 would be required in order to fully validate this tool. Such an analysis

was beyond the scope of this dissertation. In addition, replication across several provincial school boards for generalizability may be beneficial.

There may have been bias in the sample studied, since participants consisted of educators who self-selected to participate. Those that chose to participate may have been those with an increased interest in learning more about self-regulation, or those with knowledge of the investigator's background, which may have impacted their openness and ideas about self-regulation. The educators may have been those who were not already too overwhelmed to participate in a research study and thus experiencing lower stress than other educators who did not participate.

One of the primary challenges throughout this study was that as it progressed it became apparent that it was not going to be a straightforward measurement of what worked to support student self-regulation as originally planned, because the existing measures being used in the research were varied and founded on very different philosophical frameworks like self-control (e.g., the HKTS task of measuring impulse control and compliance). Measurement in neurophysiological self-regulation is a growing field and includes measures like heart rate variability which works in a lab setting but would not be accurate in a dynamic classroom environment. Current research in neurophysiological measures like heart rate variability are mostly focused on exercise paradigms and stress recovery, and there is a need to apply this new understanding of the stress response system to early learning contexts. Ideally, a study investigating the vagal tone / heart rate variability / stress response of students in classrooms using either behaviourally-based approaches or psychophysiologically-based approaches could be telling.

Current research in self-regulation, specifically in kindergarten contexts as described in the literature review, is mostly centered around self-control, and there were no studies focused on educator understanding of self-regulation to build upon. Further exploration in neurophysiological approaches towards self-regulation in kindergarten classrooms is encouraged. Furthermore, the current study relied on a framework (Shanker Self-Reg; Shanker, 2016) that is not yet empirically studied. Shanker Self-Reg is a framework that does not specify what an educator should be doing, and effective educator facilitation depends on a clear understanding of the science underlying Shanker's framework of self-regulation as a system. Further study is required to better understand the impact that professional development about the underlying theoretical framework has on educator practice. Future researchers may wish to consider examining the implementation and outcomes of available programs such as *Al's Pals* (Wingspan, 2004) or *Zones of Regulation* (Kuypers, 2011) *after* educator participation in professional development on the theory and science that underlies self-regulation, such as *Shanker Self-Reg* (Shanker, 2016).

Throughout this study, the definitional categories of Agency, Social Behaviour, and Self-Monitoring were noted very few times in educators' descriptions of self-regulation and in how they facilitated self-regulation. It could be that these categories of self-regulation were more relevant to other contexts and philosophical understandings. For example, Burman et al (2015) suggest that while Learning / Learning Strategies may be most relevant and familiar to teachers, Agency was relevant to those studying the self (e.g. volition, self-determination, self-efficacy), Self-Monitoring was most relevant to those interested in personality assessment (e.g., cognitive therapy and techniques, conscientiousness), , and Social Behaviour related to those studying

specific social skills (e.g., impulse control of socially appropriate behaviours), so one might not expect to see these last three emerging in educational contexts as often.

Lastly, while results may point to areas of need for professional development, it was not the intention to provide an in-depth analysis of professional development models or provide in-depth recommendations in this area, though this would be an interesting and important area for future exploration and study.

6.5. Recommendations

The following recommendations are made based on the emerging themes from the current study within the context of the kindergarten self-regulation literature.

6.5.1. Start with Personal Educator Self-Regulation

In *How Does Learning Happen* (Government of Ontario, 2014), the National Scientific Council on the Developing Child states the following:

> By strengthening the capacities of adults who care for children, building skills such as coping with stressors, self-regulation and the ability to solve problems, focus attention and make decisions, families and educators in early years settings can reduce vulnerability for children and for themselves. (p. 61)

As noted in Chapter 2, when outlining Shanker's Self-Reg Process, co-regulation is a critical component of developing self-regulation. Jennings et al., (2013) found that by decreasing teacher stress and increasing their sense of well-being, teachers became better able to establish supportive relationships with their students, promoting attachment and improving school climate. Similarly, Shanker highlights our tendency to co-regulate each other's affective states by sharing our own—we perceive and are influenced by the states of others, and our own states affect those around us. As described in Chapter 2, much of Greenspan's comprehensive and foundational

work in affective child development is grounded in the fact that co-regulation is the very foundation of self-regulation in infancy and early childhood. Later, Sossin and Charone-Sossin (2007) suggested that this process can develop into the ability to transition among inner states where one is better able to predict the behaviours of others over time. In relation to my findings, educators who are showing signs of stress need to first be able to self-regulate themselves personally before they would be able to effectively facilitate self-regulation in their students. If educators are dysregulated themselves (as indicated throughout observations and self-assessments), students will pick up on this stress and experience the educator's stress themselves because experiencing other people's stress is a known prosocial stressor (Schore, 2012a). Professional development that simply trains educators how to deliver cognitively based lessons to their students does not support this co-regulatory process as part of the dynamic system of self-regulation. There are publicly available resources available to educators (e.g., EduGAINS, Early Years Studies), and the current study's Self-Reg Checklist (SCEIC) may also be used to guide and monitor Ministry-recommended self-regulation practices. It would be ideal to see this framework for self-regulation being included in educators' pre-service training, an area where teachers and ECEs may differ.

6.5.2. Shift from Programs to Mindsets

Boards are currently using programs to teach educators how to facilitate self-regulation. Programs can be a more concrete and cognitively simpler process than the higher-level learning of changing one's attitudes and beliefs to affect application and synthesis (Anderson et al., 2001), but they unfortunately address only knowledge rather than application. Knowing *about* self-regulation is not the same as *doing* it, a higher-order skill that goes beyond cognition (Clinton, 2020). Programs, though, often have limited empirical support, and the available programs for

self-regulation target self-regulation using a self-control lens, not the same comprehensive neurophysiological framework adopted by the *Kindergarten Program* (Ontario Ministry of Education, 2016).

Boards would do well to consider training that instead focuses on the philosophy and recommendations provided in the *Kindergarten Program* itself, rather than selecting external resources that do not align with the Kindergarten curriculum. It may be that kindergarten educators have a more general learning-based understanding of child development, whereas ECEs are more focused on child development, and behaviour consultants on behavioural control. Boards may also wish to consider which kinds of specialists are selected to support classrooms (another form of professional development for educators to learn) and provide training to these consultants to ensure that their practices also align with recent advances on neurophysiology underlying the *Kindergarten Program* so that educators are getting a consistent message about self-regulation that aligns with the curriculum.

Lastly, providing educators more time together as a team (which emerged as one potential reason Ava and Bev had more success in facilitating self-regulation) may enable teachers and ECEs to share the strengths of their respective pre-service training with one another to develop a cohesive approach that blends the human development expertise of ECEs with the educational expertise of teachers. Perhaps more importantly, developing strong relationships with colleagues may serve as personal self-regulation through social engagement. Shanker (2016), Clinton (2020), and Tantam (2018) reveal through their work on relationships (Porges, 2009, 2015; Sabol & Pianta, 2012) that one's self-regulation is grounded in feelings of safety learned through social engagement. Educators working in teams may be able to co-regulate one another in order to remain regulated enough to co-regulate their respective students. Furthermore, boards may wish

to complement this social engagement with training and opportunities for personal self-regulation of their educators, who may well learn self-regulation best by being given opportunities to actually engage in the process by reframing, recognizing, reducing, reflecting upon, and responding to their own stresses as per Shanker's steps/principles referenced in the *Kindergarten Program* itself (Ontario Ministry of Education, 2016).

6.5.3. Reframe Existing Practices with a Neurophysiological Mindset

Reframing is a critical aspect to moving forward with research and practice across contexts (Shanker & Burgess, 2017). Reframing is one of the five practices of *Shanker Self-Reg* (Shanker, 2016) and is a common theme of popular educator resources. For example, Boyce's *The Orchid and the Dandelion* (Boyce, 2019) reframed resilience by taking the blame off the child for behaviour and learning challenges and highlighted the importance of a specific and nurturing environment for some children. Similarly, Gopnick's (2016) *The Gardener and the Carpenter* reframed the ways we approach child development from building children according to a plan, adding as we go, to nurturing the environmental conditions allowing them to flourish naturally. Clinton (2020) expanded these ideas, highlighting that self-regulation is not either/or, but rather a continuum where we do have curriculum ideas in mind (like a carpenter with blueprints), but that we also need to organically create environments that allow children's natural capacity for learning to flourish (like a gardener).

When an educator thinks about self-regulation as connected more closely to well-being than to behaviour management, their approaches may shift towards the framework described in the *Kindergarten Program* as per Dagnan et al's (1998) findings that when educators believe behaviours are under the child's control, they resort to punitive responses and Nungesser and

Watkins' (2005) findings that educators who believe that behaviour is a child's choice turn to reactive responses to behaviour such as time-out and loss of privileges.

Some of the teacher practices may simply need reframing to align with the *Kindergarten Program's* recommendations. Some practices may appear to be neurophysiological brain-body practices (e.g., meditation) but are in fact facilitated using a self-control framework such as when meditation was used as a group reward for compliant sitting rather than achieving an individualized state of calm. When taught as a group, Reddy and Roy (2019) suggest that there should ideally be ways to personalize the experience, from body positioning, to length of time engaged in the process, to cognitive processes employed during the experience. Reframing meditation in these ways may help educators to see meditation as an individual practice that may work for some but not others, and as a practice that students may choose to use throughout the day as they reflect on how they are feeling in the moment (neurophysiological arousal) rather than as a group activity to be used at a scheduled time, or reactively when many other children are over-aroused (a behaviour management approach).

Daily Five is a structured literacy program that some educators mentioned as a way to support self-regulation in the classroom and while the program is not focused on teaching self-regulation, an educator might use tools like Daily Five to reduce cognitive stressors, one of the five domains of stressors in the Shanker Self-Reg process. In addition, Daily Five fosters student choice which Glasser (1999) contends can positively enhance engagement in learning activities. Through structured organization of the thought process in learning within the Daily Five program, as well as scaffolding of the cognitive process of literacy, Daily Five can contribute to the entire process of self-regulation for a given student by helping to reduce the cognitive stress load.

Could programs founded on self-control, like the *Al's Pals* and *Zones of Regulation* that the educators report using, be reframed as well? Certainly, if one examines these programs using a neurophysiological lens, it is possible to select some components of the programs that can contribute to a neurophysiological framework being facilitated in the classroom. For example, *Al's Pals* references many socio-emotional skills such as problem-solving, sharing, and making healthy choices that could contribute to prosocial skill development allowing students to empathize with one another and co-regulate one another more effectively. The *Zones of Regulation* program includes some graphics and visual representations that may make it easier for some students to understand and share how they are feeling physically and emotionally. Reframing enables educators to make meaningful choices about how to approach these programs in their classroom facilitation. These choices may include shifting the focus away from trying to control one's impulses and behaviours and toward recognizing and understanding the stressors that caused these impulses, reducing them, and responding to them with restorative practices that impact their bodies in positive ways. Perhaps having increased familiarity with resources from Shanker, Greene, and Delahooke would be a good starting place in helping educators understand self-regulation as neurophysiological in order to reframe their existing practices and programs and facilitate them accordingly.

Finally, self-regulation in the Kindergarten program is directly connected to well-being as part of the Self-Regulation and Well-Being (SRWB) frame (Appendix L), and not to behaviour management as emerged in the current study. It would be interesting to note whether educator mindsets about self-regulation would shift if the connection to well-being was highlighted throughout professional development, as opposed to being connected to behaviour management as it is in the programs used by the school boards which may be easier to measure and observe.

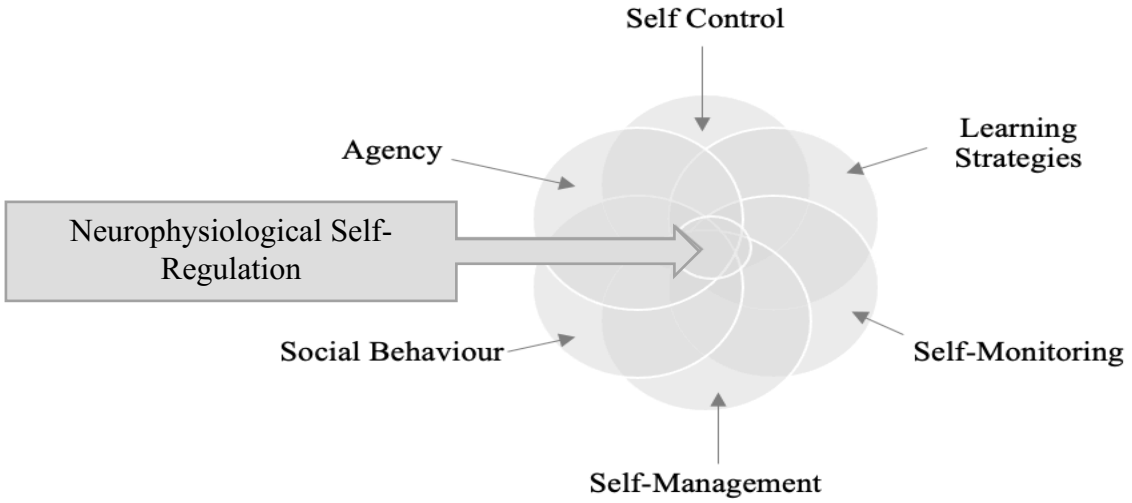
Perhaps making this connection to well-being through reflective professional development opportunities using the neurophysiological resources mentioned above may help educators to reframe what self-regulation is all about—well-being.

6.5.4. Understand the Heart of Self-Regulation and How it Overlaps Other Categories

As shown in Figure 31, neurophysiological self-regulation lies at the heart of all the other definitions, and by nature, includes overlaps with each of them (though none of the other definitions fully encapsulate all of what self-regulation is).

Figure 31

Neurophysiological Self-Regulation at the Heart of and Overlapping the Other Definitions



Reframing does not mean refuting the existence of self-control but looking at it in a new way based on recent advances in neuroscience. As Shanker (2016) suggests, self-regulation precedes self-control and often makes self-control unnecessary. If we were to shift the focus in classrooms to a neurophysiological framework supporting the self-regulation of students and understand that self-regulation is a precursor to self-control, there would be less need to focus on self-control (behaviour control, emotion control). When using a neurological framework, there

would likely be fewer stress behaviours and students' natural tendency towards inquiry-based learning would be better facilitated as suggested by Clinton (2020), Delahooke (2019), Greene (2007), and Shanker (2016), based on the original neurophysiological self-regulation research (Cannon, 1939; Porges, 2009). Further research into student behaviour outcomes as a result of educator philosophy towards stress behaviour could be advantageous as well as exploring the correlates of behaviour, learning, and neurophysiological measures like Porges' (2009) heart rate variability.

Many of the practices and strategies that educators use, as revealed through the systematic literature review as well as findings in the current study, could be reframed with the knowledge of where true self-regulation lies using a neurophysiological lens in order to create self-regulation environments that align with the *Kindergarten Program* and its underlying research. For example, some of the kindergarten literature in self-regulation referred to self-monitoring during reading (Martin & Kragler, 2012) and metacognition (Hwang, Gorrell, & Chung, 2003), which may not represent the entire construct of self-regulation but may be part of the individualized process of reducing stressors for a student. Cognitive strategies like working on executive function (Von Salisch, Hänel, & Denham, 2015) and/or working memory (Kim et al., 2016) may help to reduce cognitive stressors if needed, which is again part of the holistic Shanker Self-Reg© (2016) process. Perhaps an understanding of the five domains of stressors would be helpful in training educators to recognize hidden stressors across all domains in each student's experience. Often, there is a tendency to focus on just the cognitive stressors, especially in a classroom (Clinton, 2020). Clinton (2020) advises:

> I suggest we reconsider our view of children and childhood. If we think of kids as capable and think of parenting and educating them in terms of supporting them as they use their

> innate curiosity, love of learning, drive to grow and empathy toward others, we interact differently with them. If we take [this] approach [as opposed to filling them up with information], we're able to create an environment in which they learn and where they demonstrate self-regulation. (p. 51)

By focusing on all the domains rather than just the cognitive domain that might be connected to a learning strategies approach, perhaps we could better support educators to develop more confidence in recognizing stressors in their classrooms.

6.5.5. Use the SCEIC as a Guide

There were not many Ministry-recommended practices observed during classroom observations (overall, 17% of environmental recommendations, 20% of facilitation recommendations, and 34% of relationship recommendations were observed). The SCEIC is a summary of the recommendations of the Kindergarten Program (Ontario Ministry of Education, 2016b), and relevant resources for helping educators learn how to facilitate self-regulation including EduGAINS (*EduGAINS Kindergarten Home*, 2017), The Learning Exchange (*Kindergarten Matters : Intentional Play-Based Learning*, 2017), How Does Learning Happen (Government of Ontario, 2014), and the TMC Class Environment Reflection Tool (The MEHRIT Centre, n.d.; see Appendix J). As such, the SCEIC may be a useful tool and guide to help educators increase the number of Ministry-recommended self-regulation practices occurring in their classrooms. The Kindergarten curriculum document discusses the importance of the classroom environment. However, a classroom where students are all expected to do the same thing at the same time is viewed as counterproductive to self-regulation (Bronson, 2000). Choice in materials and space, activities promoting care and kindness, collaborative problem solving, and reframing behaviour as stress-based, are all elements of an environment included on the

SCEIC, and with further research and development with larger sample sizes, may serve as a useful tool for adjusting classroom environments for the effective facilitation of self-regulation.

6.6 Conclusion

The Early Years Studies (McCain and Mustard, 1999; McCain et al, 2007, McCain et al, 2011; McCain, 2020) collectively show that today's families are experiencing significant stress and that universal support is needed in the early years to help manage well-being and long-term outcomes as learned through advances in neuroscience over the last 20 years. The Early Years reports indicate that studies in neurophysiology and epidemiology have continued to demonstrate the connection among the neurological stress pathway and behaviour, physical and mental health, anxiety, substance abuse, and other problems later in life. The research indicates that behavioural, psychological, and physical problems (McCain et al., 2007) can result in interventions that treat these behavioural, psychological, and physical 'symptoms', but that educators' interventions had been mostly unsuccessful at changing this trajectory (McCain & Mustard, 2002) and educators were looking for answers. The Early Years Studies argue that teachers could impact positive developmental change through an upstream neurophysiological approach to child development (looking at the causes and risk factors of stress) rather than focusing on the much more expensive and less efficient downstream effects (looking at the consequences or symptoms) of behaviour challenges in the classroom (McCain & Mustard, 1999). The *Kindergarten Program* (Ontario Ministry of Education, 2016b) was later designed to do just that by examining why children entering school were so vulnerable as revealed in the Early Development Instrument (EDI; Janus & Offord, 2007) and selected a framework which would help—the Shanker Self-Reg framework (Shanker, 2016).

This dissertation sought to contribute to the understanding of whether a neurophysiological framework was being facilitated in Kindergarten classrooms, and if not, why not? The findings point to the need for educators and the administrators who guide their professional development to develop a better understanding of the philosophical framework underlying the *Kindergarten Program's* neurophysiological Self-Regulation and Well-Being frame so that educators can effectively facilitate their own and their students' self-regulation rather than focusing on the resulting behaviour management needs. Findings revealed educator reliance on programs targeting behaviour management and self-control without fully understanding the theory and science underlying the construct of self-regulation. Effective facilitation of self-regulation includes the creation of a safe and nurturing environment (Boyce, 2019; Clinton, 2020; Jennings et al., 2013), facilitation of individualized self-regulation processes of reframing/recognizing stressors/reducing stressors/reflecting/restorative practices (Shanker, 2016), and the development of empathetic and co-regulatory relationships which scaffold their students' development of self-regulatory competencies (Sabol & Pianta, 2012; Schore, 2012a; Tantam, 2018).

Although other definitions, such as self-control and learning strategies may be related to self-regulation, they do not fully encompass the entirety of self-regulation, as proposed by Shanker's comprehensive definition, and can result in increased stress and even dissociation in some cases (Porges, 2013). This study does not refute the importance of self-control, but instead reframes it and puts it in context of other constructs related to self-regulation such as the unconscious neurophysiology underlying stress behaviour which precedes conscious behavioural choices. Neurophysiological self-regulation lies at the heart of self-regulation according to

Burman et al (2015), and this serves as a helpful way for educators to begin thinking about and facilitating self-regulation.

References

Achenbach, T. M., & Howell, C. T. (1993). Are American children's problems getting worse? A 13-year comparison. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*(6), 1145–1154. https://doi.org/10.1097/00004583-199311000-00006

Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives* (Complete ed.). Longman.

Andreou, E., & Rapti, A. (2010). Teachers' causal attributions for behaviour problems and perceived efficacy for class management in relation to selected interventions. *Behaviour Change, 27*(1), 53–67. https://doi.org/10.1375/bech.27.1.53

Barbarin, O. (2013). A longitudinal examination of socioemotional learning in African American and Latino boys across the transition from pre‐K to kindergarten. *American Journal of Orthopsychiatry, 83*(2‐3), 156‐164. https://doi.org/10.1111/ajop.12024

Barrett, P., Zhang, Y., Moffat, J., & Kobbacy, K. (2013). A holistic, multi-level analysis identifying the impact of classroom design on pupils' learning. *Building and Environment, 59*, 678–689. https://doi.org/10.1016/j.buildenv.2012.09.016

Bassett, H. H., Denham, S., Wyatt, T. M., & Warren‐Khot, H. K. (2012). Refining the Preschool Self-Regulation Assessment for use in preschool classrooms. *Infant and Child Development, 21*(6), 596‐616. https://doi.org/10.1002/icd.1763

Berry, D., McCartney, K., Petrill, S., Deater‐Deckard, K., & Blair, C. (2014). Gene‐environment interaction between DRD4 7‐repeat VNTR and early child-care experiences predicts self-regulation abilities in prekindergarten. *Developmental Psychobiology, 56*(3), 373–391.https://doi.org/10.1002/dev.21105

Best Start Expert Panel on Early Learning. (2007). *Early Learning for Every Child Today; A framework for Ontario early childhood settings*. Ontario Ministry of Education. http://www.edu.gov.on.ca/childcare/oelf/continuum/continuum.pdf

Bibou-Nakou, I., Kiosseoglou, G., & Stogiannidou, A. A. (2000). Elementary teachers' perceptions regarding school behavior problems: Implications for school psychological services. *Psychology in the Schools, 37*(2), 123‑134. https://doi.org/10.1002/(SICI)1520-6807(200003)37:2<123::AID-PITS4>3.0.CO;2-1

Billman, G. E., Huikuri, H. V., Sacha, J., & Trimmel, K. (2015). An introduction to heart rate variability: Methodological considerations and clinical applications. *Frontiers in Physiology*, 1–3.

Bjorklund, D. (2018). A metatheory for cognitive development (or "Piaget is dead" revisited). *Child Development, 89*(6), 2288–2302.

Bodrova, E., & Leong, D. (2008). Developing self-regulation in kindergarten: Can we keep all the crickets in the basket? *Young Children, 63*(2), 56–58.

Boekaerts, M., & Niemivirta, M. (2000). Self-Regulated Learning: Finding a Balance between Learning Goals and Ego-Protective Goals. In Zeidner, M.P. (Ed.), *Handbook of Self-Regulation*. Academic Press. http://www.sciencedirect.com/science/article/pii/B9780121098902500421

Bowlby, J. (1965). *Child care and the growth of love (2nd ed.).* Penguin Books.

Boyce, W. T. (2019). *The orchid and the dandelion: Why some children struggle and how all can thrive*. Penguin Random House.

Bradley, R. T., McCraty, R., Atkinson, M., Tomasino, D., Daugherty, A., & Arguelles, L. (2010). Emotion self-regulation, psychophysiological coherence, and test anxiety: Results

from an experiment using electrophysiological measures. *Applied Psychophysiology and Biofeedback, 35*(4), 261–283. https://doi.org/10.1007/s10484-010-9134-x

Bronson, M. (2000). *Self-regulation in early childhood: Nature and nurture*. New York. Guilford Press.

Brooker, R. J., Kiel, E. J., & Buss, K. A. (2016). Early social fear predicts kindergarteners' socially anxious behaviors: Direct associations, moderation by inhibitory control, and differences from nonsocial fear. *Emotion, 16*(7), 997–1010. https://doi.org/10.1037/emo0000135

Brotman, L. M., Dawson-McClure, S., Calzada, E. J., Huang, K.-Y., Kamboukos, D., Palamar, J. J., & Petkova, E. (2013). Cluster (School) RCT of ParentCorps: Impact on kindergarten academic achievement. *Pediatrics, 131*(5), 1521–e1529. https://doi.org/10.1542/peds.2012-2632

Bruner, J. S. (2006). *In search of pedagogy: The selected works of Jerome S. Bruner* [electronic resource]. Routledge.

Buchan, J. (2017). *Effective strategies for teaching and learning independence in literacy: The Daily 5 literacy structure* [Whitepaper]. The 2 Sisters.

Burman, J. T. (2020, July 30). On the meanings of self-regulation [Personal communication].

Burman, J. T., Green, C. D., & Shanker, S. (2015). On the meanings of self-regulation: Digital humanities in service of conceptual clarity. *Child Development, 5*, 1507–1521.

Byrnes, J. P., & Fox, N. A. (1998). The educational relevance of research in cognitive neuroscience. *Educational Psychology Review, 10*(3), 297.

Cannon, W. B. (1939). *The wisdom of the body (2nd ed.)*. Norton & Co.

Carney, P., & Parr, M. (2014). *Resilient, active, and flourishing: Supporting positive mental health and well-being in school communities (Research Monograph #58).* Government of Ontario. http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/WW_ResilientFlourish.pdf

Carver, C. S., & Scheier, M. F. (2000). On the structure of behavioral self-regulation. In Zeidner, M.B. (Ed.), *Handbook of Self-Regulation*. Academic Press. http://www.sciencedirect.com/science/article/pii/B9780121098902500329

Clinton, J. (2014). *Supporting Ontario's youngest minds: Investing in the mental health of children under 6*. Canadian Electronic Library.

Clinton, J. (2020). *Love Builds Brains*. Tall Pine Press.

Covey. (n.d.). Research Highlights & Leadership Results. Leader In Me. Retrieved September 8, 2020, from https://www.leaderinme.org/research-highlights-leadership/

Covey, S. R. (2004). *The 7 habits of highly effective people: Restoring the character ethic*. Free Press.

Creamer, E. G. (2017). *An introduction to fully integrated mixed methods research*. SAGE Publications.

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches.* Sage.

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Sage.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research (3rd ed.)*. Sage.

Dagnan, D., Trower, P., & Smith, R. (1998). Care staff responses to people with learning disabilities and challenging behaviour: A cognitive-emotional analysis. *British Journal of Clinical Psychology, 37*(1), 59–68. https://doi.org/10.1111/j.2044-8260.1998.tb01279.x

Dawson-McClure, S., Calzada, E., Huang, K.-Y., Kamboukos, D., Rhule, D., Kolawole, B., Petkova, E., & Brotman, L. M. (2015). A population-level approach to promoting healthy child development and school success in low-income, urban neighborhoods: Impact on parenting and child conduct problems. *Prevention Science, 16*(2), 279–290. https://doi.org/10.1007/s11121-014-0473-3

Delahooke, M. (2017). *Social and emotional development in early intervention*. PESI Publishing and Media.

Delahooke, M. (2019). *Beyond Behaviours*. PESI Publishing and Media.

Denham, S. A., Bassett, H. H., Zinsser, K., & Wyatt, T. M. (2014). How preschoolers' social‐emotional learning predicts their early school success: Developing theory-promoting competency-based assessments. *Infant and Child Development, 23*(4), 426‐454. https://doi.org/10.1002/icd.1840

Denham, S., Bassett, H., Way, E., Mincic, M., Zinsser, K., & Graling, K. (2012). Preschoolers' emotion knowledge: Self-regulatory foundations, and predictions of early school success. *Cognition and Emotion, 26*(4), 667–679. https://doi.org/10.1080/02699931.2011.602049

Diamond, L. M., Fagundes, C. P., & Butterworth, M. R. (2012). Attachment style, vagal tone, and empathy during mother–adolescent interactions. *Journal of Research on Adolescence, 22*(1), 165–184. https://doi.org/10.1111/j.1532-7795.2011.00762.x

Dollar, J. M., Stifter, C. A., & Buss, K. A. (2017). Exuberant and inhibited children: Person-centered profiles and links to social adjustment. *Developmental Psychology, 53*(7), 1222–1229. https://doi.org/10.1037/dev0000323

Dubas, J. S., Lynch, K. B., Galano, J., & Hunt, D. (1998). Preliminary evaluation of a resiliency-based preschool substance abuse and violence prevention project. *Journal of Drug Education, 28*(3), 235–255.

Dunckley, V. (2015, August 18). Screentime is making kids moody, crazy, and lazy. *Psychology Today*. https://www.psychologytoday.com/blog/mental-wealth/201508/screentime-is-making-kids-moody-crazy-and-lazy

Edugains Kindergarten Home. (2017). http://www.edugains.ca/newsite/Kindergarten/index.html

EduGains Viewing Guide. (2012). http://www.edugains.ca/newsite/aer/prolearnfac/video_guides.html

Effeney, G., Carroll, A., & Bahr, N. (2013). Self-regulated learning and executive function: Exploring the relationships in a sample of adolescent males. *Educational Psychology, 33*(7), 773–796. https://doi.org/10.1080/01443410.2013.785054

Eiden, R. D., Colder, C., Edwards, E. P., & Leonard, K. E. (2009). A longitudinal study of social competence among children of alcoholic and nonalcoholic parents: Role of parental psychopathology, parental warmth, and self-regulation. *Psychology of Addictive Behaviors, 23*(1), 36–46. https://doi.org/10.1037/a0014839

Eiden, R. D., Lessard, J., Colder, C. R., Livingston, J., Casey, M., & Leonard, K. E. (2016). Developmental cascade model for adolescent substance use from infancy to late adolescence. *Developmental Psychology, 52*(10), 1619–1633. https://doi.org/10.1037/dev0000199

Elementary Teachers' Federation of Ontario. (2008). *Full-day kindergarten: Moving Ontario forward.* Elementary Teachers' Federation of Ontario.

Fitzpatrick, C., & Pagani, L. S. (2013). Task-oriented kindergarten behavior pays off in later childhood. *Journal of Developmental and Behavioral Pediatrics, 34*(2), 94–101. https://doi.org/10.1097/DBP.0b013e31827a3779

Fogel, A., King, B. J., & Shanker, S. (2008). *Human development in the twenty-first century: Visionary ideas from systems scientists*. Cambridge University Press.

Forgas, J. P., Baumeister, R. F., & Tice, D. M. (2009). The psychology of self-regulation: An introductory review. In *Psychology of self-regulation: Cognitive, affective, and motivational processes*. Psychology Press.

FranklinCovey Education. (n.d.). *Leader in Me Research Guide.* Covey Education. https://img03.en25.com/Web/FranklinCoveyCo/%7B7183011a-585b-4108-9883-5e9366dade19%7D_EDU184903_LiM_Research_Guide_v1.3.1_HRE.pdf

Friese, S. (2019). *Qualitative data analysis with Atlas.ti.* Sage.

Fullan, M. (1997*). The challenge of school change: A collection of articles.* RI/Skylight Training and Publishing.

Fullan, M. (2010). The awesome power of the principal. *Principal, 89*(4), 10-12.

Furnham, A. (1986). Response bias, social desirability and dissimulation. *Personality and Individual Differences, 7*(3), 385–400. https://doi.org/10.1016/0191-8869(86)90014-0

Gambro, J. S., & Switzky, H. N. (1991). Motivational orientation and self-regulation in young children. *Early Child Development and Care, 70*, 45–51. https://doi.org/10.1080/0300443910700105

Garner, J. K. (2009). Conceptualizing the relations between executive functions and self-regulated learning. *Journal of Psychology, 143*(4), 405–426.

Glasser, W. (1999). *Choice theory: A new psychology of personal freedom.* HarperPerennial.

Gopnick, A. (2016). *The Gardener and the carpenter: What the new science of child development tells us about the relationship between parents and children*. MacMillan.

Gordon, M. (2003). Roots of Empathy: Responsive parenting, caring societies. *The Keio Journal of Medicine, 52*(4), 236–243.

Gould, S. J. (1977). Human babies as embryos. In *Ever Since Darwin*. W.W. Norton.

Government of Ontario. (2014). *How does learning happen? Ontario's pedagogy for the early years.* Queen's Printer for Ontario. http://www.edu.gov.on.ca/childcare/pedagogy.html

Graziano, P. A., & Hart, K. (2016). Beyond behavior modification: Benefits of social–emotional/self-regulation training for preschoolers with behavior problems. *Journal of School Psychology*, 58, 91–111. https://doi.org/10.1016/j.jsp.2016.07.004

Greene, R. W. (2007). *The explosive child: A new approach for understanding and parenting easily frustrated, chronically inflexible children*. HarperCollins.

Greenspan, S. I. (2007). Levels of infant-caregiver interactions and the DIR Model: Implications for the development of signal affects, the regulation of mood and behavior, the formation of a sense of self, the creation of internal representation, and the construction of defences and character structure. *Journal of Infant, Child & Adolescent Psychotherapy, 6*(3), 174–210.

Greenspan, S. I., & Shanker, S. (2004). *The first idea: How symbols, language, and intelligence evolved from our primate ancestors to modern humans.* Da Capo Press.

Greenspan, S. I., Wieder, S., & Simons, R. (1998). *The child with special needs: Encouraging intellectual and emotional growth*. Perseus Books.

Greenspan, S., & Shanker, S. (2007). The developmental pathways leading to pattern recognition, joint attention, language and cognition. *New Ideas in Psychology, 25*, 128–142. https://doi.org/10.1016/j.newideapsych.2007.02.007

Grolnick, W. (2009). The role of parents in facilitating autonomous self-regulation for education. *Theory and Research in Education, 7*(2), 164–173.

Grolnick, W. S., & Ryan, R. M. (1989). *Parent styles associated with children's self-regulation and competence in school. Journal of Educational Psychology, 81*(2), 143–154. http://dx.doi.org.ezproxy.lakeheadu.ca/10.1037/0022-0663.81.2.143

Hatfield, B. E., & Williford, A. P. (2016). Cortisol patterns for young children displaying disruptive behavior: Links to a teacher-child, relationship-focused intervention. Prevention Science: *The Official Journal of the Society for Prevention Research*. https://doi.org/10.1007/s11121-016-0693-9

Hirschler‐Guttenberg, Y., Golan, O., Ostfeld‐Etzion, S., & Feldman, R. (2015). Mothering, fathering, and the regulation of negative and positive emotions in high‐functioning preschoolers with autism spectrum disorder. *Journal of Child Psychology and Psychiatry, 56*(5), 530–539. https://doi.org/10.1111/jcpp.12311

Hoffman, J. (2018). The effects of implementing a zones of regulation curriculum in a third grade classroom. *Dissertations, Theses, and Projects*. https://red.mnstate.edu/thesis/62

Hotulainen, R., & Lappalainen, K. (2011). Pre-school socio-emotional behaviour and its correlation to self-perceptions and strengths of young adults. *Emotional & Behavioural Difficulties, 16*(4), 365–381. https://doi.org/10.1080/13632752.2011.616342

Howse, R. B., Calkins, S. D., Anastopoulos, A. D., Keane, S. P., & Shelton, T. L. (2003). Regulatory contributors to children's kindergarten achievement. *Early Education and Development, 14*(1), 101–119. https://doi.org/10.1207/s15566935eed1401_7

Hwang, Y. S., Gorrell, J., & Chung, K. S. (2003). Self-regulated problem-solving awareness among korean children. *Research in the Schools, 10*(1), 33–40.

Janus, M., Duku, E., & Schell, Amanda. (2012). *The Full Day Kindergarten Early Learning Program Final Report*. Offord Centre for Child Studies, McMaster University.

Janus, M., & Offord, D. (2007). Development and psychometric properties of the Early Development Instrument (EDI): A measure of children's school readiness. *Canadian Journal of Behavioural Science, 39*(1), 1–22.

Jennings, P. A., Frank, J. L., Snowberg, K. E., Coccia, M. A., & Greenberg, M. T. (2013). Improving classroom learning environments by Cultivating Awareness and Resilience in Education (CARE): Results of a randomized controlled trial. *School Psychology Quarterly, 28*(4), 374–390. https://doi.org/10.1037/spq0000035

Joy, J. M. (2017). Evaluating positive social competence in preschool populations. *The School Community Journal, 26*(2), 263–289.

Kim, H., Byers, A. I., Cameron, C. E., Brock, L. L., Cottone, E. A., & Grissmer, D. W. (2016). Unique contributions of attentional control and visuomotor integration on concurrent teacher-reported classroom functioning in early elementary students. *Early Childhood Research Quarterly, 36*, 379–390. https://doi.org/10.1016/j.ecresq.2016.01.018

Kindergarten Matters: Intentional Play-Based Learning. (2017). http://curriculum.org/secretariat/kindergarten/index.html

Köckeritz, M., Klinkhammer, J., & von Salisch, M. (2010). Die entwicklung des emotionswissens und der behavioralen selbstregulation bei vorschulkindern mit und ohne migrationshintergrund. *Praxis der Kinderpsychologie und Kinderpsychiatrie, 59*(7), 529–544. https://doi.org/10.13109/prkk.2010.59.7.529

Kuypers, L. M. (2011). *The Zones of Regulation: A curriculum designed to foster self-regulation and emotional control.* Think Social Publishing.

Leyva, D., & Nolivos, V. (2015). Chilean family reminiscing about emotions and its relation to children's self-regulation skills. *Early Education and Development, 26*(5), 22.

Loman, M. M., & Gunnar, M. R. (2010). Early experience and the development of stress reactivity and regulation in children. *Neuroscience & Biobehavioral Reviews, 34*(6), 867–876. https://doi.org/10.1016/j.neubiorev.2009.05.007

Lynch, K. B. (1996). *Evaluation report: Resilient children making healthy choices project 1994-1995.* Virginia Institute for Developmental Disabilities at Virginia Commonwealth University.

Lynch, K. B. (1997). *Evaluation report: Resilient children making healthy choices project 1995-1996.* Virginia Institute for Developmental Disabilities at Virginia Commonwealth University.

Lynch, K. B., Geller, S. R., & Schmidt, M. G. (2004). Multi-year evaluation of the effectiveness of a resilience-based prevention program for young children. *Journal of Primary Prevention, 24*(3), 335–353.

Mac Cobb, S., Fitzgerald, B., & Lanigan-O'Keeffe, C. (2014). The Alert Program for self-management of behaviour in second level schools: Results of phase 1 of a pilot study. *Emotional & Behavioural Difficulties, 19*(4), 410–425.

Mac Cobb, S., Fitzgerald, B., Lanigan-O'Keeffe, C., Irwin, N., & Mellerick, N. (2014). Students with social, emotional, and behavioral difficulties: The Alert Program trial in post-primary schools. *Journal of Occupational Therapy, Schools & Early Intervention, 7*(2), 106.

Maclean, P. D. (1985). Evolutionary psychiatry and the triune brain. *Psychological Medicine, 15*(2), 219.

Mahler, K. (2017). *Interoception: The Eighth Sensory System: Practical Solutions for Improving Self-Regulation, Self-Awareness and Social Understanding of Individuals with Autism Spectrum and Related Disorders*. SpringerLink. https://doi.org/10.1007/s10803-016-2848-8

Malaguzzi, L., 1920-1994, Verfasser. (2016). *Loris Malaguzzi and the schools of Reggio Emilia a selection of his writings and speeches, 1945-1993*. Routledge, Taylor and Francis Group.

Manning, B. H., White, C. S., & Daugherty, M. (1994). Young children's private speech as a precursor to metacognitive strategy use during task engagement. *Discourse Processes, 17*(2), 191–211. https://doi.org/10.1080/01638539409544866

Marshall, P. J. (2015). Neuroscience, embodiment, and development. In *Handbook of Child Psychology and Developmental Science: Theory and Method* (Vol. 1, pp. 244–283). Wiley.

Martin, L. E., & Kragler, S. (2012). Early signs of self-regulating print: Kindergartners at work reading to understand fiction and nonfiction text. *Journal of Research in Childhood Education, 26*(2), 141–153. https://doi.org/10.1080/02568543.2012.659648

Matthews, G., Schwean, V. L., Campbell, S. E., Saklofske, D. H., & Mohamed, A. A. R. (2000). Personality, self-regulation, and adaptation: a cognitive-social framework. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-Regulation*. Academic Press. http://www.sciencedirect.com/science/article/pii/B9780121098902500354

McCain, M. N. (2020). *Early years study 4: Thriving kids, thriving society*. Margaret and Wallace McCain Family Foundation Inc. https://earlyyearsstudy.ca/wp-content/uploads/2020/02/EYS4-Report_01_15_2020.pdf

McCain, M. N., McCuaig, K., & Mustard, J. F. (2011). *Early years study 3: Making decisions, taking action [electronic resource].* Toronto, ON: Margaret & Wallace McCain Family Foundation.

McCain, M. N., & Mustard, J. F. (1999). *Early years study 1: Reversing the real brain drain (E-book collection Online)*. Toronto, ON: Canadian Institute for Advanced Research.

McCain, M. N., & Mustard, J. F. (2002). *The early years study three years later. From early child development to human development: enabling communities [electronic resource]*. Toronto, ON: Founders' Network of the Canadian Institute for Advanced Research.

McCain, M. N., Mustard, J. F., & Shanker, S. (2007). *Early years study 2: Putting science into action.* http://www.ecdgroup.com/docs/lib_004403008.pdf

McClelland, M. M., & Cameron, C. E. (2012). Self-regulation in early childhood: Improving conceptual clarity and developing ecologically valid Measures. *Child Development Perspectives, 6*(2), 136–142. a9h. https://doi.org/10.1111/j.1750-8606.2011.00191.x

McIntyre, L. L., Blacher, J., & Baker, B. L. (2006). The transition to school: Adaptation in young children with and without intellectual disability. *Journal of Intellectual Disability Research, 50*(5), 349–361. https://doi.org/10.1111/j.1365-2788.2006.00783.x

Montag, C., & Panksepp, J. (2017). Primary emotional systems and personality: An evolutionary perspective. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2017.00464

Munro, K. L. (2017). *The efficacy of Zones of Regulation in teaching grade 3 and 4 students self-regulation skills* [Thesis, City University of Seattle]. http://repository.cityu.edu/handle/20.500.11803/650

Muraven, M., & Baumeister, R. F. (2000). Self-Regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247–259.

Neitzel, C., Alexander, J. M., & Johnson, K. E. (2016). Young children's interest-oriented activity and later academic self-regulation strategies in kindergarten. *Journal of Research in Childhood Education, 30*(4), 474–493.

Nichols, S.D. (2010). *Perception and implementation of the Ohio academic content and process standards for mathematics among middle school teachers* (ED520367) [Doctoral dissertation]. Retrieved from ProQuest LLC.

Nungesser, N. R., & Watkins, R. V. (2005). Preschool teachers' perceptions and reactions to challenging classroom behavior: implications for speech-language pathologists. *Language, Speech, and Hearing Services in Schools, 36*(2), 139–151. https://doi.org/10.1044/0161-1461(2005/013)

Day Nurseries Act, no. R.S.O. 1990 (1990). https://www.ontario.ca/laws/statute/90d02

Ontario Ministry of Education (Ed.). (2013). *Think, feel, act: Lessons from research about young children.* Queen's Printer for Ontario. http://www.edu.gov.on.ca/childcare/selfRegulate.html

Ontario Ministry of Education. (2016a). *Growing success; The Kindergarten addendum.* https://www.edu.gov.on.ca/eng/policyfunding/growSuccess.pdf

Ontario Ministry of Education. (2016b). *The Kindergarten Program 2016*. Queen's Printer for Ontario. https://www.ontario.ca/document/kindergarten-program-2016?_ga=1.205844243.1286588484.1456677012

Pandey, A., Hale, D., Das, S., Goddings, A.-L., Blakemore, S.-J., & Viner, R. M. (2018). Effectiveness of universal self-regulation–based interventions in children and adolescents: A Systematic Review and Meta-analysis. *JAMA Pediatrics, 172*(6), 566. https://doi.org/10.1001/jamapediatrics.2018.0232

Pascal, C. (2009). *With our best future in mind- implementing early learning in Ontario*. [Report to the Premier by the Special Advisor on Early Learning].

Patriquin, M. A., Scarpa, A., Friedman, B. H., & Porges, S. W. (2013). Respiratory sinus arrhythmia: A marker for positive social functioning and receptive language skills in children with autism spectrum disorders. *Developmental Psychobiology, 55*(2), 101–112. https://doi.org/10.1002/dev.21002

Pears, K. C., Fisher, P. A., Kim, H. K., Bruce, J., Healey, C. V., & Yoerger, K. (2013). Immediate effects of a school readiness intervention for children in foster care. *Early Education and Development, 24*(6), 771–791. https://doi.org/10.1080/10409289.2013.736037

Pears, K. C., Kim, H. K., & Fisher, P. A. (2012). Effects of a school readiness intervention for children in foster care on oppositional and aggressive behaviors in kindergarten. *Children and Youth Services Review, 34*(12), 2361–2366. https://doi.org/10.1016/j.childyouth.2012.08.015

Pears, K. C., Kim, H. K., Healey, C. V., Yoerger, K., & Fisher, P. A. (2015). Improving child self-regulation and parenting in families of pre-kindergarten children with developmental

disabilities and behavioral difficulties. *Prevention Science, 16*(2), 222–232. https://doi.org/10.1007/s11121-014-0482-2

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-Regulation*. Academic Press. http://www.sciencedirect.com/science/article/pii/B9780121098902500433

Ponitz, C. C., McClelland, M. M., Matthews, J. S., & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Developmental Psychology, 45*(3), 605–619. https://doi.org/10.1037/a0015365

Ponitz, C. E. C., McClelland, M. M., Jewkes, A. M., Connor, C. M., Farris, C. L., & Morrison, F. J. (2008). Touch your toes! Developing a direct measure of behavioral regulation in early childhood. *Early Childhood Research Quarterly, 23*(2), 141–158. https://doi.org/10.1016/j.ecresq.2007.01.004

Porges, S. W. (2009). The polyvagal theory: New insights into adaptive reactions of the autonomic nervous system. *Cleveland Clinic Journal of Medicine, 76*(2) https://doi.org/10.3949/ccjm.76.s2.17

Porges, S. W. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. W. W. Norton.

Porges, S. W. (2015). Making the world safe for our children: Down-regulating defence and up-regulating social engagement to 'optimise' the human experience. *Children Australia, 40*(2), 114.

Porges, S. W., & Furman, S. A. (2011). The early development of the autonomic nervous system provides a neural platform for social behaviour: A polyvagal perspective. *Infant & Child Development, 20*(1), 106–118. https://doi.org/10.1002/icd.688

Post, Y., Boyer, W., & Brett, L. (2006). A historical examination of self-regulation: Helping children now and in the future. *Early Childhood Education Journal, 34*(1), 5-14. https://doi.org/10.1007/s10643-006-0107-x

Pratt, M. E., Lipscomb, S. T., & McClelland, M. M. (2016). Caregiver responsiveness during preschool supports cooperation in kindergarten: Moderation by children's early compliance. *Early Education and Development, 27*(4), 421–439. https://doi.org/10.1080/10409289.2016.1090767

Primary Sources. (2013). *America's teachers on teaching in an era of change: A project of Scholastic and the Bill and Melinda Gates Foundation (Primary Sources).* Bill and Melinda Gates Foundation. http://www.scholastic.com/primarysources/PrimarySources3rdEditionWithAppendix.pdf

Reyna, C., & Weiner, B. (2001). Justice and utility in the classroom: An attributional analysis of the goals of teachers' punishment and intervention strategies. *Journal of Educational Psychology, 93*(2), 309–319. https://doi.org/10.1037/0022-0663.93.2.309

Rorhbeck, C. A., Azar, S. T., & Wagner, P. E. (1991). Child Self-Control Rating Scale: Validation of a child self-report measure. *Journal of Clinical Child Psychology, 20*(2), 179.

Rossman, G. B., & Wilson, B. (1985). Number and Words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review, 9*(5), 627–643.

Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher–child relationships. *Attachment & Human Development, 14*(3), 213–231. https://doi.org/10.1080/14616734.2012.672262

Sakairi, Y., Nakatsuka, K., & Shimizu, T. (2013). Development of the Two- Dimensional Mood Scale for self-monitoring and self-regulation of momentary mood states. *Japanese Psychological Research, 55*(4), 338–349. https://doi.org/10.1111/jpr.12021

Sasser, T. R., Beekman, C. R., & Bierman, K. L. (2015). Preschool executive functions, single-parent status, and school quality predict diverging trajectories of classroom inattention in elementary school. *Development and Psychopathology, 27*(3), 681–693. https://doi.org/10.1017/S0954579414000947

Scarpa, A., & Reyes, N. (2011). Improving emotion regulation with CBT in young children with high functioning autism spectrum disorders: A Pilot Study. *Behavioural and Cognitive Psychotherapy, 39*(4), 495–500.

Schonert-Reichl, K. A., & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre- and early adolescents' well-being and social and emotional competence. *Mindfulness, 1*(3), 137–151. https://doi.org/10.1007/s12671-010-0011-8

Schonert-Reichl, K. A., Oberle, E., Lawlor, M., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental Psychology, 51*, 52–66. http://doi.org/10.1037/a0038454.

Schore, A. N. (2012a). *Bowlby's "Environment of evolutionary adaptedness": Recent studies on the interpersonal neurobiology of attachment and emotional development*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199755059.003.0002

Schore, A. N. (2012b). *The science of the art of psychotherapy*. W.W. Norton.

Shanker, S. (2010, November 13). *The development of self-regulation*. People for Education Conference. http://www.peopleforeducation.ca/wp-content/uploads/2011/09/P4E-Conference-2010-Stuart-Shanker-Presentation.pdf

Shanker, S. (2012). *Calm, alert, and learning*. Pearson.

Shanker, S. (2016). *Self-Reg: How to help your child (and you) break the stress cycle and successfully engage with life*. Penguin Random House.

Shanker, S., & Burgess, C. (2017). Self-reg and reframing. *Reframed; The Journal of Self-Reg*, 1(1), 28–34.

Shanker, S., & Hopkins, S. (2019). *Self-reg schools: A handbook for educators*. Pearson.

Sharma, R., Khera, S., Mohan, A., Gupta, N., & Ray, R. B. (2006). Assessment of computer game as a psychological stressor. *Indian Journal of Physiology and Pharmacology, 50*(4), 367–374.

Shonkoff, J. P., & Phillips, D. A. (2000). *From neurons to neighbourhoods: The science of early childhood development*. National Academy Press.

Skinner, B. F. (1957). *Verbal behavior*. Prentice-Hall.

Skosnik, P. D., Chatterton, R. T., Swisher, T., & Park, S. (2000). Modulation of attentional inhibition by norepinephrine and cortisol after psychological stress. *International Journal of Psychophysiology, 36*(1), 59–68. https://doi.org/10.1016/s0167-8760(99)00100-2

Somech, L. Y., & Elizur, Y. (2012). Promoting self-regulation and cooperation in pre-kindergarten children with conduct problems: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 51*(4), 412–422. https://doi.org/10.1016/j.jaac.2012.01.019

Sossin, K. M., & Charone-Sossin, J. (2007). Embedding: Co-regulation within therapeutic process: lessons from development: Response to "Co-regulated interactions: Implications for Psychotherapy …," paper by Stanley Greenspan. *Journal of Infant, Child & Adolescent Psychotherapy, 6*(3), 259–279.

Strommen, E. A. (1973). Verbal self-regulation in a children's game: Impulsive errors on "Simon says." Child Development, 44(4), 849–853. https://doi.org/10.2307/1127737

Summers, G. F. (1969). Toward a paradigm for respondent bias in survey research. *The Sociological Quarterly, 10*(1), 113–121.

Talwar, V., Carlson, S. M., & Lee, K. (2011). Effects of a punitive environment on children's executive functioning: A natural experiment. *Social Development, 20*(4), 805–824. https://doi.org/10.1111/j.1467-9507.2011.00617.x

Tantam, D. (2018). *The Interbrain: Embodied connections versus common knowledge.* Jessica Kingsley.

Thayer, J. F., Hansen, A. L., Saus-Rose, E., & Johnsen, B. H. (2009). Heart rate variability, prefrontal neural function, and cognitive performance: The neurovisceral integration perspective on self-regulation, adaptation, and health. *Annals Of Behavioral Medicine: A Publication Of The Society Of Behavioral Medicine, 37*(2), 141–153. https://doi.org/10.1007/s12160-009-9101-z

The Hawn Foundation. (2011). *The MindUp curriculum*. Scholastic.

The MEHRIT Centre. (n.d.). *Class Environment Reflection Tool.* https://self-reg.ca/toolkit/

The MEHRIT Centre. (2017). *Self-Reg Competencies Rubric*. The MEHRIT Centre. http://self-reg.ca/wp-content/uploads/2020/06/2_1_Self_Reg_Competencies_Rubric_V3.pdf

Timmons, K., & Pelletier, J. (2016). Using latent-class analysis to examine the influence of kindergarten children's perspectives of school on literacy and self-regulation outcomes. *Early Child Development and Care, 186*(11), 1737–1751. https://doi.org/10.1080/03004430.2015.1131157

Tranter, D., Carson, L., & Boland, T. (2018). *The Third Path: A relationship-based approach to student well-being and achievement*. Nelson.

Tranter, D., & Kerr, D. (2016). *Understanding self-regulation: Why stressed students struggle to learn (Research Monograph #63).* http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/ww_struggle.pdf

Upshur, C., Wenz-Gross, M., & Reed, G. (2013). A pilot study of a primary prevention curriculum to address preschool behavior problems. *The Journal of Primary Prevention, 34*(5), 309–327. https://doi.org/10.1007/s10935-013-0316-1

Vohs, K. D., & Baumeister, R. F. (2016). *Handbook of self-regulation: Research, theory, and applications*. Guilford Publications.

von Salisch, M., Haenel, M., & Denham, S. A. (2015). Self-regulation, language skills, and emotion knowledge in young children from northern Germany. *Early Education and Development, 26*(5–6), 792–806. https://doi.org/10.1080/10409289.2015.994465

Vygotsky, L. S., Verfasser. (1962). *Thought and language*. The M. I. T. Press.

Watson, J. (1913). Psychology as the Behaviorist Views it. Psychological Review, 20, 158–177.

Webster-Stratton, C., Reid, M. J., & Stoolmiller, M. (2008). Preventing conduct problems and improving school readiness: Evaluation of the Incredible Years teacher and child training programs in high-risk schools. *Journal of Child Psychology and Psychiatry, 49*(5), 471–488. https://doi.org/10.1111/j.1469-7610.2007.01861.x

Weinert, F. (2014). Lines of descent: Kuhn and beyond. *Foundations of Science, 19*(4), 331. https://doi.org/10.1007/s10699-013-9342-y

Williams, M. S., & Shellenberger, S. (1996). *How does your engine run?: A leader's guide to The Alert Program for self-regulation.* TherapyWorks, Inc.

Wingspan. (2004). *Al's Pals: Kids Making Healthy Choices (Vol. 1).* Wingspan. www.wingspanworks.com

Wittgenstein, L., Pears, D. f., & McGuinness, B. f. (2001). *Tractatus logico philosophicus.* [Electronic resource]. Routledge.

Zeytinoglu, S., Calkins, S. D., Swingler, M. M., & Leerkes, E. M. (2017). Pathways from maternal effortful control to child self-regulation: The role of maternal emotional support. *Journal of Family Psychology, 31*(2), 170–180. https://doi.org/10.1037/fam0000271

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation*. Academic Press. http://www.sciencedirect.com/science/article/pii/B9780121098902500317

Appendices

Appendix A: Kindergarten Communication of Learning Template

Kindergarten Communication of Learning – *Roman Catholic Schools*

Ontario Ministry of Education

Kindergarten Communication of Learning

Date:

Student:	OEN:	Days Absent:	Total Days Absent:
Year 1 ☐ Year 2 ☐ Teacher:		Times Late:	Total Times Late:
Early Childhood Educator:		Early Childhood Educator:	
Board:		School:	
Address:		Address:	
		Principal:	Telephone:

PLACEMENT IN SEPTEMBER ➡ ***Kindergarten Year 2*** ☐ ***Grade 1*** ☐

Religious and Family Life Education

[Comments about student learning should be entered in a font size that is clear and legible.]

Belonging and Contributing ☐ ESL ☐ IEP

Key Learning / Growth in Learning / Next Steps in Learning

[Comments about student learning should be entered in a font size that is clear and legible.]

Self-Regulation and Well-Being ☐ ESL ☐ IEP

Key Learning / Growth in Learning / Next Steps in Learning

[Comments about student learning should be entered in a font size that is clear and legible.]

Student: OEN: Year 1 ☐ Year 2 ☐

Demonstrating Literacy and Mathematics Behaviours ☐ ESL ☐ IEP
Key Learning / Growth in Learning / Next Steps in Learning
[Comments about student learning should be entered in a font size that is clear and legible.]

Problem Solving and Innovating ☐ ESL ☐ IEP
Key Learning / Growth in Learning / Next Steps in Learning
[Comments about student learning should be entered in a font size that is clear and legible.]

ESL – English as a Second Language
IEP – Individual Education Plan

To Parents/Guardians: This copy of the Kindergarten Communication of Learning should be retained for reference. The original or an exact copy has been placed in the student's Ontario Student Record (OSR) folder and will be retained for five years after the student leaves school.

Teacher's Signature
X _____

Principal's Signature
X _____

Early Childhood Educator(s) _____ [Insert name(s)] _____ contributed to the observation, monitoring, and assessment of your child's learning that is reflected in this Kindergarten Communication of Learning.

Student: OEN: Year 1 ☐ Year 2 ☐

The Four Frames

In Kindergarten, the learning expectations are connected with four "frames": Belonging and Contributing, Self-Regulation and Well-Being, Demonstrating Literacy and Mathematics Behaviours, and Problem Solving and Innovating. Children's learning in these four areas is evaluated and described in this report.

Belonging and Contributing focuses on children's:

- sense of connectedness to others;
- ability to form relationships and make contributions as part of a group, a community, and the natural world;
- developing understanding of how people relate to one another and to the world around them.

What children learn in connection with this frame provides them with a sense of being personally connected to various groups and communities, and lays the foundation for developing the traits and attitudes required for responsible citizenship.

Self-Regulation and Well-Being focuses on children's:

- ability to understand their own thoughts and feelings, to see that others may have different thoughts and feelings, and to respect those differences;
- ability to understand and manage their emotions and impulses, find ways to deal with distractions, and be aware that their actions have consequences;
- awareness of their physical and mental health and wellness.

What children learn in connection with this frame allows them to focus, to learn, to respect themselves and others, and to promote well-being in themselves and others.

(continued on page 4)

✂ Kindergarten Communication of Learning (***Please complete, sign, and detach the form below, and return it to your school.***) ✂

Student:	Year 1 ☐ Year 2 ☐	OEN:	Teacher: _____ Early Childhood Educator(s): _____

Parent's/Guardian's Comments

I notice that my child has shown growth in the following areas:

I will help my child to:

☐ I have received this Communication. ☐ I would like to discuss this Communication. Please contact me.

Parent's/Guardian's Name (*please print*)	Signature X	Date
Telephone Number (*day*): _____	Telephone Number (*evening*): _____	

Appendix B: Educator Survey

Self-Regulation Classroom Survey

Please note that clicking 'submit' at the end of this survey indicates that you agree with the following acknowledgements:

CONSENT TO THE STUDY, ACKNOWLEDGEMENT OF MY ROLE

✅ I have read and understood the Participant Information Letter regarding the study.

✅ I agree to participate in the research as described.

✅ I understand that my participation will consist of participating in a conPdential online survey.

✅ Within the survey, I will be asked if I consent to participation in additional study components described in the next point which I can decline and my data remains conPdential with no name nor school attached to it, oı accept and provide my contact information (all information will remain conPdential and seen only by the researcher and her doctoral supervisor).

✅ I understand that my consent will consist of being asked to participate in the following OPTIONAL additional components:

(a) 2 2-hour observations of my classroom at times arranged with me in advance;
(b) participating in a 60-minute interview after observations;
(c) sharing the text from my Self-Regulation and Well Being frame of my Communications of Learning (conPdential - names removed) from the February and June 2019 reporting periods.

✅ I understand that if I am chosen to participate in optional study components a-c in the previous bullet, I will receive a book and classroom resource package and be invited to participate in and optional learning opportunity (workshop) related to self-regulation that will be organized by HSCDSB.

CONSENT TO RECORDING, GUARANTEE OF CONFIDENTIALITY

✅ I understand that my identity will not be shared and that my school and my students will not be identiPed in any publication or presentation.

✅ Right to Withdraw: I understand that I can withdraw from this study at any time prior to the end of the data collection period (November, 2019), and that I may decline to answer any question.

✅ SpeciPcally, I understand I have the right to withdraw from the study or to withdraw my consent for the use of my data (transcripts, audio Ples, communications of learning) at any time; data withdrawn will be returned to me and will not appear in any presentation or publication. My privacy and the privacy of my data will be protected and only Casey Burgess and her supervisor Dr. Sonia Mastrangelo will have access to electronic Ples, transcripts, or other artifacts collected and that all data will be kept securely for a minimum o

5 years, at which time it will be destroyed or securely archived. I understand my name and other identifying information about me, my school, or my students will not be shared and pseudonyms will be used in all presentations of the results of this study. I understand that no potential risks are anticipated for me or for my students. I also understand that I will not receive financial compensation for participation, however release time to attend a free workshop will be provided as well as a book and individualized printed resource packag about self-regulation for my classroom.

✅ I understand that once I have submitted my survey, if I have not provided a name or contact information, that my data cannot be withdrawn as it will be unable to be identified as connected to me.

✅ I understand that I may request to receive a summary report of the findings at the end of the study. I understand no penalty will be levied by Lakehead University or by my school or school board if I decline to participate.

THANK YOU SO MUCH FOR YOUR PARTICIPATION. PLEASE CONTACT CASEY BURGESS AT CBURGES1@LAKEHEADU.EDU IF YOU HAVE ANY QUESTIONS.
* Required

1. What is your role? *

Mark only one oval.

- ◯ Kindergarten Teacher
- ◯ Early Childhood Educator
- ◯ Other: _____

2. How many years of experience do you have in this role? *

_____

3. Which of the following have you participated in over your career? *

Check all that apply.

- [ ] Workshop on self-regulation (2-3 hours) that you paid for and went to on your own time
- [ ] Workshop on self-regulation (full day) that you paid for and went to on your own time
- [ ] Academic conference presentation about self-regulation (1-2 hours)
- [ ] Academic conference with a self-regulation theme / focus
- [ ] Required in-school Professional Development workshop
- [ ] Voluntary in-school Professional Development workshop
- [ ] Required board-wide Professional Development workshop
- [ ] Voluntary board-wide Professional Development workshop

Other: [ ] _____

4. How familiar are you with each of the following resources? *

Mark only one oval per row.

	I have never heard of this resource	I have heard of this resource but am not familiar with its contents	I am somewhat familiar with the main content	I am familiar with the main content and some details	I am very familiar with most of the document including the main content and details
Reversing the Real Brain Drain: Early Years Study 1 (McCain & Mustard, 1999)	◯	◯	◯	◯	◯
The Early Years Study 2 (McCain et al., 2007)	◯	◯	◯	◯	◯
Early Learning for Every Child Today					

(ELECT; Best Start Expert Panel on Early Learning, 2007)					
Full-Day Kindergarten: Moving Ontario Forward (Elementary Teachers' Federation of Ontario, 2008)					
The Early Years Study 3 (McCain, Norrie, & Mustard, 2011)					
Growing Success – The Kindergarten Addendum (Ontario Ministry of Education, 2016)					
The Kindergarten Program (Ontario Ministry of Education, 2016)					
Edugains					

(website for educators)					
Self-Reg: Helping Your Child (and you) break the stress cycle and successfully engage with life (Shanker, 2016)					
Calm, Alert, and Learning (Shanker, 2012)					
Healthy Minds, Healthy Schools (Montreuil & Tilley, 2017)					
Well Aware (Tranter, 2015)					
Zones of Regulation (Kuypers, 2011)					
How Does Your Engine Run? The Alert Program (Williams and Shellenberger, 1996)					
The Explosive					

Child (Ross Greene, 2014)					
Social and Emotional Development (Delahooke, 2017)					
Beyond Behaviors: Using Brain Science and Compassion to Understand and Solve Children's Behavioral Challenges (Delahooke, 2019)					

5. What does self-regulation mean? (please use your own description) *

6. Describe one of your well-regulated children. How do you know he/she is well-regulated? *

7. Describe one of your poorly regulated children. How do you know he/she is poorly regulated?

8. What do you do in your classroom to promote self-regulation? *

9. Would you be willing to potentially participate in further research components including a classroom observation and interviews, and review of Communication of Learning Data? Each classroom that participates in further research (requires that both the teacher and ECE agree participate) will be provided with a self-regulation resource kit including a book and classroor visuals, and be invited to participate in a full day workshop based on the results of this study. *

Mark only one oval.

- ◯ Yes
- ◯ No

If you have selected no, please skip the following questions and click 'submit' below. I thank you very much for your time taken to complete this survey. Your contributions are valuable in advancing knowledge about the facilitation of self-regulation in today's kindergarten classroor If you have selected yes, please indicate the following contact information and you may be selected and contacted for further information (this contact information will not be stored with your above responses to maintain confidentiality).

10. If yes, please indicate your name:

_____

11. If yes, please indicate your school

_____

12. If yes, please indicate your phone number:

_____

13. If yes, please indicate your preferred email address to contact you

Thank you very much for taking the time to respond to this survey. Your time is appreciated. If you have agreed to further participation, you may be contacted this fall by the researcher with further details. If you have any questions at any time, please contact cburges1@lakeheadu.edu

Appendix C: Self-Reg Classroom Environment and Implementation Checklist (SCEIC)

SCEIC

Self-Reg Classroom Environment and Implementation Checklist

BEFORE THE INTERVIEW

- Confirm meeting time and place with educator
- Confirm working order of audio equipment

BRING: (CHECKLIST)

- Audio recording device
- Digital camera
- Notebook and pens
- Observation Protocol

OBSERVATION DETAILS

School: _____

Contact Information: _____

Observation # for this classroom: 1st ❑ 2nd ❑ Date: _____

Time of Observation Start: _____ End: _____ Total Time: _____

Educator Name(s): _____

Role(s): Teacher ❑ ECE ❑

Years of Experience :

OBSERVATION OF CLASSROOM

- Take photographs of classroom from each angle
- Audiotape classroom teacher during observation
- Attach note sheets as necessary
- Put in regular time markers to field notes at least every 10 minutes to cross reference with audio later.

Observe: Behaviour management, participation, verbal communication of educators and students, nonverbal communication of educators and students, relationships among educators and students, initiation of communication, atmosphere, programs employed, expectations, self-regulation options for all 5 domains (biological, emotion, cognitive, social, prosocial), flexibility, approach, relationship among educators, play.

Instructions: Observe classroom in any context for 120-180 minutes (depending on natural class transitions). Columns A and B represent opposing behavioural or environmental observations. For each behaviour (row), put a checkmark beside the column (A or B) that most appropriately represents educator behaviour (if the behaviour was observed), and indicate a specific example of that behaviour. Accompanying field notes should be recorded on a separate sheet for additional relevant events occurring during transitions, moments of calm, or specific interactions.

		Physical Environment				
Ref	**#**	**A**	**Obs ( )**	**B**	**Obs ( )**	**Example**
d	1	Environment set up to accommodate small or large groups		Environment set up with rows of seating or specific places for each child to be		
c, d	2	A variety of lighting sources are accessible and flexibly used throughout the day (i.e. natural light, lamps)		Lighting is mostly standard fluorescent lighting and remains consistent through the day		
d	3	A variety of seating options are available		Children are expected to complete work on standard classroom chairs and desks		
d, e	4	Different spaces within classroom for multiple purposes that are flexible in the moment		Classroom is one large space with the intention of children all doing the same activity		
e	5	Walls and instructional areas are mostly bare; materials posted are referenced		There are some visual materials that are not regularly referenced (i.e. full open shelves, posters)		
d, e	6	Includes quiet area to block out sensory stimulus (i.e. tent, visual block of rest of classroom, headphones) that child can choose to use as needed		Does not include area to block out sensory stimulus or is not under child's choice to use (specify)		
c, d, e	7	Supporting sensory materials are made freely available to all as needed (e.g., exercise balls, exercise mats, squishy balls, noise-cancelling headphones)		Supporting materials are not available or educator specifies when they can be used		
	8	Visuals are used to remind children to self-reflect on how they feel and are individualized based on need		Visuals are used to show children how they should be behaving (i.e. calm) and / or are general for the entire class		
Educator Facilitation						
Ref		**A**	**Obs ( )**	**B**	**Obs. ( )**	**Examples**
d	9	Self-regulation strategies are available for students to use individually (e.g., visual schedule,yoga, breathing exercises)		Self-regulation strategies are taught via program or lesson to the whole class		
a, c	11	Extrinsic rewards are seldom used and are limited to praise / acknowledgement.		Extrinsic reinforcement is used for compliance or desired behaviour (i.e. stickers, tangibles)		
d	12	Engages child in conversation about his/her arousal levels and what affects them (includes noticing and naming the self-regulation strategies students are using in the moment)		Engages child in conversation about his/her behaviours without reference to arousal levels; teaches simply to name feelings		
d	13	Demands placed on children are responded to with compliance.		Demands placed on children lead to distress		
b	14	Educator attempts to help the child regulate with calm paraphrasing of what happened (declarative language) and empathy		Educator attempts to help the child regulate using tangible rewards and consequences for being regulated / dysregulated		
a, b, c	15	Guides students through daily experiences which help them learn what to avoid, what to engage in, to affect one's own regulation		Structures the environment with rules about what to do or not to do to prevent regulation problems		

b	17	Proactively (not in response to behaviours) asks students about how their 'engines are running'. Help them learn what it feels like to be calmly focused and alert. Guide child through self-discovery		Instructs students on what to do to calm themselves down when they appear to become dysregulated.		
b	18	Engages in communication with the child before and after self-reg-based activities and practices to reflect and self-discover		Teaches self-regulation activities without reflective activities before and after		
d	19	Encourages regular physical activity reflexively (as needed) as well as reflection before and after on how it makes the student feel		Physical activity is scheduled for specific times of the day		
d	20	Activities are individualized to allow for individual needs with options for varying physical and cognitive levels		Everyone in the class participates in the same activities with some minor adjustments if needed		
c, d	21	Facilitates children's efforts to take reasonable risks, test their limits, and gain increasing competence and a sense of mastery through active play and social interactions		Minimizes risk taking through rules and clear communication of educator's expected limits		
b	22	Educator appears regulated him/herself (calm voice, varied affect, engaged with others,)		Educator appears distressed (flushed face, dilated pupils, sweating, high pitched or loud voice)		

Relationships

Ref		A	Obs ( )	B	Obs ( )	Examples
d	24	Goes to child as quickly as possible when upset to coregulate (share their calm)		Asks a child to calm themselves down when they are upset		
c	25	Responds calmly to student distress		Responds with alarm or stress to student distress		
c, d	26	Responsive student relationships where students are given independence based on their presumed competence		Relationships where children are expected to self-control by complying with the rules set out by the educator		
d	27	Acknowledges / responds to / mimics students' non-verbal communication, including facial expressions and tone of voice.		Focus on verbal communication with little attention paid to nonverbal		
d, f	28	Uses individualized nonverbal communication effectively (individualized use of eye contact, facial expression, tone of voice, posture, gestures and touch, timing, and intensity of response) to engage students.		Non-verbal communication is inconsistent with verbal, or is similar with all children		
c	29	Focuses on strengths rather than challenges to build skills		Focuses on challenges rather than strengths in order to provide assistance		
c, d	30	Helps students to identify feelings and emotions in self and others, discuss why they might be feeling that way, and use words to identify the meaning of their own and others' expressive language		Describes / guides how a child should or should not be expressing emotions		

a	31	Engages in reciprocal interactions with children where children are both initiators and equal partners		Interactions are mostly adult-initiated, and adult-controlled		
c, d	32	Models and teaches in the moment the practise of kindness towards other people and all living things, shows concern for their well-being, acts with empathy towards them, and practises including others		Teaches kindness and sympathy/empathy cognitively, by talking **about** them		
d	33	Bullying, harrassment, and aggression are responded to with connection and empathy (i.e. empathy, hug, space, time as needed)		Bullying, harrassment, and aggression are responded to with punishment or response cost		
d	34	Allows space and time for problem solving, rather than jumping in quickly to prevent problems from occurring		Educator intervenes quickly in problems to provide solutions and prevent them from occurring		
b, c	35	Focuses on social and personal development over academic skills		Focuses on academic skills or work completion over social or personal development		

a	36	Capitalizes on opportunities for one-to-one interactions during daily routines		Focuses on whole-class instruction during daily routines		

References

The following resources, available to educators to help support them in implementing self-regulation in their classrooms, were used as resources in developing the SCEIC. Left hand columns on the observation sheets indicates which source the item references.

*a	*EduGAINS*	EduGAINS: The Four Frames. (n.d.) Retrieved from http://www.edugains.ca/newsite/Kindergarten/primaryresources/selfregulation.html
*b	*The Learning Exchange*	Kindergarten Matters: Intentional Play-based Learning; It's About Self-Regulation (n.d.) Retrieved from https://thelearningexchange.ca/projects/kindergarten-matters-intentional-play-based-learning-2/
*c	*How Does Learning Happen?*	Ontario Ministry of Education. (2014). How Does Learning Happen?. Toronto, ON: Queen's Printer for Ontario
*d	*Kindergarten Program*	Ontario Ministry of Education (2016). The Kindergarten Program. Retrieved from https://files.ontario.ca/books/kindergarten-program-en.pdf?_ga=2.167073150.1798263348.1548782502-1407833142.1547065439
*e	*TMC Class Environment Reflection Tool*	The MEHRIT Centre (2018). Class Environment Reflection Tool. Retrieved from https://self-reg.ca/toolkit/ (See Appendix F)
*f	*Brainstorm*	Siegel, D. (2013). *Brainstorm.*New York, NY: Penguin.

Appendix D: Educator Interview Questionnaire

Interviews were video-recorded and transcribed via Zoom (with grammatical corrections completed by the researcher), then analyzed using Atlas.ti for emerging themes among educator interviews.

BACKGROUND

Years of experience teaching: _____

How many of those at K level: _____

Role (ECE, teacher): _____

Degrees held: _____

AQ courses? _____

PROFESSIONAL DEVELOPMENT IN SELF-REGULATION OR WELL BEING (LIST TITLE, DATE, ORGANIZATION WHO ADMINISTERED THE TRAINING)

Workshops:

Books:

Articles:

Videos:

Courses / workshops:

Other:

THEORIES AND BELIEFS (ATTACH SEPARATE PAPER FOR NOTES)

1. How do you define self-regulation? (was asked in survey, but will be asked again for triangulation / reliability)
2. What does it mean to be a well-regulated person?
3. What is your role as an educator in the development of your students' self-regulation?
4. What is the role of the student in your students' self-regulation?
5. What is the role of the family in your students' self-regulation?
6. You described an example of a well-regulated student in your survey (read response out loud). Is there anything you would like to add to this?
7. You described an example of a poorly-regulated student in your survey (read response out loud). Is there anything you would want to add to this?

PLANNING OF TEACHING AND ASSESSMENT

8. Do you have a plan or process for including self-regulation in your classroom? (i.e. lessons, activities)

9. How do you *document* self-regulation in your classroom from day to day? (for example: team discussions, focus on process or outcomes, focus on standardized procedures, reflective practice, assessment for/as/of learning)
10. How do you *assess* self-regulation in your classroom for reporting purposes? (for example: team discussions, focus on process or outcomes, focus on standardized procedures, reflective practice, assessment for/as/of learning)

PROFESSIONAL DEVELOPMENT

11. Describe your professional development experiences – what was helpful and what was not in learning about self-regulation?
12. What relevant support do you receive as an educator in learning about how to facilitate self-regulation?
13. Have you encountered any barriers in facilitating self-regulation in your practice? If yes, describe.
14. Do you set time aside in your day for specifically teaching self-regulation? How much time, and how do you teach SR?
15. Look at the Self-Reg Rubric (see Appendix I). Where do you feel you are at in terms of your understanding and embodiment of self-reg in each step? (interviewer to circle appropriate area for each interviewee)
16. Have you shared your experiences and knowledge of SR with those who don't have as much knowledge or experience? With whom? How?
17. What would help you to enhance your practice?

18. Is there anything else you would like to add?

FURTHER PARTICIPATION:

After data collection, the researcher will provide a one-day professional learning opportunity (or two half-days) related to ideas presented on this survey that you are invited to attend at no cost. Are you interested in participating in a professional learning opportunity that will be related to the ideas presented on this survey?

☐Yes ☐ No

If you answered yes, please provide your name, an email address, and a telephone number where you can be contacted (this sheet is kept separately from your interview data so your responses remain anonymous).

Name: _____

Email address: _____

Phone number: _____

Appendix E: Study Information Letter for Principals

Project Title: Self-Regulation Facilitation in Kindergarten Classrooms
Investigator: Casey Burgess

Date:

Dear Administrator,

I am a doctoral candidate in the Joint PhD in Educational Studies program at Lakehead University. While my program is based out of Thunder Bay, I am currently situated in Sault Ste Marie, Ontario. I am writing to invite your kindergarten educators (teachers and early childhood educators) to participate in my study entitled, *From Paper to Practice: Educator Understanding and Facilitation of Self-Regulation in the Kindergarten Classroom*.

My goal is to explore educator understanding and facilitation of self-regulation in their classrooms and provide resources and recommendations to support them in continuing to do so most efficiently and effectively. The Kindergarten curriculum is relatively new within the province and I hope to contribute to the conversation around effective, research-based practices for the facilitation of self-regulation in early learning environments. Self-regulation has the potential to support the well-being of students now and into the future.

The purpose of my study is to analyze self-regulation practices in Ontario Kindergarten classrooms. Doing so would hopefully support educator understanding and facilitation of the self-regulation and well-being frame of the *Kindergarten Program* document, and inform future professional development and practice in educational as well as other contexts.

This study aligns with XDSB School Board's Multiyear Strategic Plan 2015-2020 for Supportive Environments and Well-Being, including XDSB's goals to (p.5 of XDSB's Multi-Year Strategic Plan 2015-2020):

Maintain a safe, inclusive, respectful, and caring climate in all our communities

Raise awareness and understanding about mental health needs and supports

These goals include considering well-being in the design of workspaces and buildings and assessment through the development of protocol and facilitation of operational recommendations (p.6 of XDSB's Mental Health Strategy/Plan 2016/17), which I hope that this study could contribute valuable information to.

I will distribute a survey to all kindergarten educators (teacher and Early Childhood Educators) this spring (2019) to determine their professional development experience in self-regulation and their understanding of the definition of self-regulation provided within the Kindergarten curriculum document. Participants will be asked if they agree to participation in further elements of the study (Communication of Learning text, classroom observations, educator interviews). If participants decline, all data collected remains anonymous. If they accept, they will share their

personal contact information which will identify them, but all responses remain confidential and will only be seen by the researcher; pseudonyms will be used for all data analysis.

For those who agree to further participation, I will obtain the anonymous text from the self-regulation and well-being frames of their Communications of Learning progress reports written in June 2019 to look at how educators describe their students' self-regulation with no identifying student information, and parents will be sent a letter asking them to contact me if they choose to have their child's data excluded.

I plan to complete one audio-recorded classroom observation in the school board in June with educators who agree to be observed to pilot a data collection tool I have developed. Next, I will complete twelve classroom observations in the school board in September – October 2019 (6 classrooms visited twice for about 2 hours each to observe both the teacher and the ECE), and interview those educators who have been observed, through open-ended questions about their experiences and facilitation of self-regulation. At the observation, I will videotape the classroom environment when there are no children in the room, ensuring not to document any identifying information about the school, educator, or students.

While audio-taping may cause some trepidation among educators, please be assured that the intent is not to evaluate educator practice nor document children, but to be able to accurately and objectively analyze elements of practice that may be missed in the moment and the types of learning opportunities used within the environment, to later support teachers wishing for further resources in self-regulation facilitation through a one-day workshop (or two half-days) to be scheduled at the board's convenience (schedule to be discussed as there are potential release costs if scheduled outside of existing Professional Development schedule). Furthermore, each participating classroom will be provided with a resource kit of printed materials individualized to their interests and needs as well as a copy of Stuart Shanker's book, *Self-Reg: How to Help Your Child (and you) Break the Stress Cycle and Successfully Engage with Life*, cited in Ontario's Kindergarten Program of 2016.

Care will be taken to maintain confidentiality of all participating educators and students in their classrooms. Transcription of all data will be completed solely by myself, and pseudonyms or descriptors will be used, rather than names of educators, students, or schools. If an educator is concerned about audio recording, I can work from field notes with pseudonyms when communicating with XDSB personnel. If parents or guardians are concerned about the sharing of report card data with identifying information removed, their child's report card will be excluded from the data the teacher shares with me. All hard copy data will be kept in a personal locked filing cabinet accessible only to myself and my doctoral supervisor for a minimum of five years from the end of the study in accordance with the policies of the university's Research Ethics Board and the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*. Any electronic data will be stored on Lakehead University servers (via password-protected Google Drive accessible only to myself and my doctoral supervisors). Copies of all consent forms for educators and information letters for parents or guardians are attached to this letter.

If you have any questions or concerns about the study, please contact me at (705) 255-5665 or email my doctoral supervisor, Dr. Sonia Mastrangelo at smastran@lakeheadu.ca at any time.

This study has been approved by the Lakehead University Research Ethics Board as well as the Huron Superior Catholic District School Board Ethics Committee. If you have questions related to the ethics of the research and would like to speak to someone outside of the research team,

please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or by email at research@lakeheadu.ca.
Should you wish to participate in the study, please complete and return the attached consent form to signify your intention to participate. Thank you for your interest in my research. I look forward to the opportunity to work and learn with your school board.

Sincerely,

Casey Burgess, PhD Candidate
Lakehead University

Appendix F: Participant Letter

Date:

Dear Kindergarten Educator,

I am a doctoral candidate in the Joint PhD in Educational Studies program at Lakehead University, and am currently situated in Sault Ste Marie, Ontario. I am writing to invite you, as a Kindergarten educator (teacher or early childhood educator) to participate in my study entitled, *From Paper to Practice: Educator Understanding and Facilitation of Self-Regulation in the Kindergarten Classroom*.

My goal is to better understand what educators need to most effectively facilitate self-regulation in their classrooms and provide resources and recommendations to support them in continuing to do so most efficiently and effectively. The Kindergarten curriculum is relatively new within the province and I hope to contribute to the conversation around effective, research-based practices for the facilitation of self-regulation in early learning environments. This study aligns with Huron Superior Catholic District School Board's Multiyear Strategic Plan 2015-2020 for Supportive Environments and Well-Being, including acknowledgement that self-regulation has the potential to support the mental health and well-being of students now and into the future.

The duration of the study's data collection will be from May 2019, to July 2019. Your participation would involve answering an online survey about your professional development experience in self-regulation and your descriptions of what self-regulation means. As part of the survey, you will be invited to participate in an optional follow-up classroom observation and interview, and to share anonymous information from the Self-Regulation and Well-Being frame of the June 2019 Communications of Learning. If you choose to participate in these components, I would like to observe your classroom twice for about 2 hours each time, and at a later time or date, talk to you and your teaching partner (separately) about your classroom self-regulation practices. The purpose of the observations is to document different ways that self-regulation practices occur in kindergarten classrooms. I am seeking permission to audio record my observations and discussions for accuracy. I understand that audiotaping may cause trepidation, but my intent is not to evaluate your practice or document individual children. If you are concerned about audiotaping, I can work from field notes with pseudonyms when communicating with XDSB personnel. Parents will be provided with a letter offering the opportunity for them to opt out of their child's anonymous data being shared through their communications of learning text or potentially being heard in the background of audio recordings. If any parents or guardians are concerned about the sharing of this anonymous data, it will be excluded from data collection.

Your participation in my study is voluntary. Classroom observation activities are intended to have a low risk of discomfort for you and your students; however, it is possible that you and / or your students may experience discomfort. My presence in your classroom is intended to be unobtrusive and should not unduly disrupt your classroom routines. Should you and your

teaching partner consent to be involved, you can withdraw at any time during the observation period without penalty and all data collected from you will be excluded from the study. All information provided is voluntary, and you may decline to answer any question during interviews. Your identity and the identity of your school board, school, and of your students will be protected at all times, and a pseudonym will be used in any written or oral presentation of results.

As an incentive for your participation in this research project, you will receive an invitation to participate in a workshop with release time coverage to be negotiated with XDSB. Furthermore, at the completion of the data collection process, your classroom will receive a resource kit of printed materials individualized to your own interests and needs as well as a copy of Stuart Shanker's book, *Self-Reg: How to Help Your Child (and you) Break the Stress Cycle and Successfully Engage with Life*, cited in Ontario's *Kindergarten Program* of 2016.

Care will be taken to maintain confidentiality of all participating educators and students in their classrooms. Pseudonyms or descriptors will be used, rather than names of educators, students, or schools. All raw data will be kept in a personal locked filing cabinet accessible only to myself and my doctoral supervisors for a minimum of five years from the end of the study in accordance with the policies of the university's Research Ethics Board and the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*. Any electronic data will be stored on Lakehead University servers (via password-protected Google Drive accessible only to myself and my doctoral supervisors). Copies of all consent forms for educators and information letters for parents or guardians are attached to this letter.

A report of our findings will be shared with XDSB at the end of the study and copies can be made available to you as well. In the future, I plan to publish findings in educational research journals and present at academic conferences to further discuss self-regulation practices in the classroom. Currently, early years' education is at the forefront of research agendas worldwide and I hope to encourage further discussion amongst educators, administrators, and policymakers through the ongoing implementation of the 2016 *Kindergarten Program*.

If you have any questions or concerns about the study, please contact me at (705) 255-5665 or email cburges1@lakeheadu.ca or my doctoral supervisor, Dr. Sonia Mastrangelo at smastran@lakeheadu.ca at any time.

This study has been approved by the Lakehead University Research Ethics Board (PENDING) as well as the Huron Superior Catholic District School Board (PENDING). If you have questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or by email at research@lakeheadu.ca.

Should you wish to participate in the study, please complete and return the attached consent form to signify your intention to participate. Thank you for your interest in my research. I look forward to the opportunity to work and learn with your school board.

Sincerely,

Casey Burgess, PhD Candidate
Lakehead University

Participant Consent Form

Project Title: From Paper to Practice: Educator Understanding and Facilitation of Self-Regulation in the Kindergarten Classroom

Investigator: Casey Burgess, PhD Candidate

Date:

___**No**, I choose not to participate in the research at all.
___**Yes**, I agree to participate in the research. I consent to participate in a study from May 2019 to October 2019, to examine self-regulation understanding and facilitation practices in Kindergarten.

I acknowledge that: (please check all that apply)

Consent to the Study, Acknowledgement of My Role:

- ☐ I have read and understood the Participant Information Letter regarding the study.
- ☐ I agree to participate in the research as described.
- ☐ I understand that my participation will consist of participating in an anonymous online survey. Within the survey, I will be asked if I consent to participation in additional study components described in the next point which I can decline and remain anonymous, or accept and provide contact information (all information will remain confidential)
- ☐ I understand that my consent will consist of being asked to participate in the following:
  (a) 2 2-hour observations of my classroom at times arranged with me in advance;
  (b) participating in a 60-minute interview after observations;
  (c) sharing the text from my Self-Regulation and Well Being frame of my Communications of Learning (anonymous - names removed) from the June 2019 reporting periods.
- ☐ I understand that if I am chosen to participate in optional study components a-c in the previous bullet, I will receive a classroom resource package and be invited to participate in and optional learning opportunity (workshop) related to self-regulation that will be organized by XDSB.

Consent to Recording, Guarantee of Confidentiality:

- ☐ I give permission to the research team to audio-record me in my classroom and audio-tape our interviews or discussions.
- ☐ I understand that my identity will not be shared and that my school and my students will not be identified in any publication or presentation.

Right to Withdraw:

- I understand that I can withdraw from this study at any time prior to the end of the data collection period (October, 2019), and that I may decline to answer any question.
- Specifically, I understand I have the right to withdraw from the study or to withdraw my consent for the use of any portion of my data (transcripts, audio files, communications of learning, survey data) at any time. I understand data withdrawn will be returned to me and will not appear in any presentation or publication. My privacy and the privacy of my data will be protected and only Casey Burgess, Dr. Mastrangelo, and the research team will have access to electronic files, transcripts, or other artifacts collected and that all data will be kept securely for a minimum of 5 years, at which time it will be destroyed or securely archived. I understand my name and other identifying information about me, my school, or my students will not be shared and pseudonyms will be used in all presentations of the results of this study. I understand that no potential risks are anticipated for me or for my students. I also understand that I will not receive financial compensation for participation, however release time to attend a free workshop will be provided as well as an individualized printed resource package about self-regulation for my classroom.
- I understand that I may request to receive a summary report of the findings at the end of the study. I understand no penalty will be levied by Lakehead University or by my school or school board if I decline to participate.

Name of participant: (Please print): _____
Signature of Participant: _____
Date: _____

(Please retain one copy of this consent letter for your records and one return one copy to the investigator)

Appendix G: Parent and Guardian Information Letter

Project Title: From Paper to Practice: Educator Understanding and Facilitation of Self-Regulation in the Kindergarten Classroom

Investigator: Casey Burgess, PhD Candidate

Date:

I am a doctoral candidate in the Faculty of Education at Lakehead University researching early childhood and self-regulation. I am very excited to work with kindergarten teachers and early childhood educators in Sault Ste Marie. The kindergarten educators in your child's classroom have been invited to participate in a research study that looks at how educators incorporate the self-regulation part of the new (2016) Kindergarten program. Your child's classroom educators have agreed to help gather information about how they teach kindergarten. This information will be helpful because we will use our observations to plan professional learning opportunities throughout the year for the classroom educators to benefit each of their students.

The duration of my study is from May 2019 to October 2019. During this time, I will visit your child's classroom to observe specific learning opportunities. These visits will include a microphone placed on the educator to allow me to document self-regulation activities in kindergarten; it is so I can hear the teacher from one unobtrusive place in the room without having to follow them around. It is the nature of classroom observations that, at times, children's voices can be heard in audio recordings. Audio records are used to document classroom happenings only, are confidential, and will not be published. Personally identifying information about your child, such as his or her name, the educators' names, nor the name of the school or board is also kept confidential and will not appear in any oral or written publication of the results of this study. Copies of audio and/or video recordings and transcripts will be kept in a locked filing cabinet accessible only to myself and my doctoral supervisor, or saved on a password protected server at Lakehead University for a minimum of five years from the end of the study, at which time they will be deleted or destroyed.

Although all classroom observation activities are intended to have a low risk of discomfort for your child, it is possible that a child may feel uncomfortable or shy. My presence in your child's classroom and school is intended to be unobtrusive and there will be no foreseeable interruptions to his or her study. I will not be interacting with the children during the 2-hour visit. If you have concerns about the nature of classroom observation activities, and particularly, if you are concerned that your child's voice not appear in recordings, please contact the classroom educators or Casey Burgess directly at the contact information below and we will arrange to mask or delete your child's voice from the recordings.

In the future, I plan to publish my study results in educational research journals and to present at academic conferences to further discuss self-regulation in the early years. The full day *Kindergarten Program* is still very new, and my results will be of interest to educators,

administrators, and policy makers who work with children in the early years. I will offer a summary of my findings to the Huron Superior Catholic District School Board after the study and you may contact them or me directly to request a copy.

If you have any questions or concerns about my study or about your child's participation, please contact your child's classroom educators, or contact me, Casey Burgess, at cburges1@lakeheadu.ca or my doctoral supervisor, Dr. Sonia Mastrangelo, at smastran@lakeheadu.ca at any time.

This study has been approved by the Lakehead University Research Ethics Board and Huron Superior Catholic District School Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-8283 or by email at research@lakeheadu.ca or Lisa Newton, Research and Decision Support Services, Simcoe County District School Board at (705) 734- 6363 x11731 or by email at lmnewton@scdsb.on.ca. Should you wish to participate in the study, please complete and return the attached consent form to signify your intention to participate. Thank you for your interest in our research. We look forward to the opportunity to work and learn with you.

Sincerely,

Casey Burgess
PhD Candidate
Lakehead University

Appendix H: Prospective (a-priori) Codes

physical environment - flexible physical space
physical environment – organization
physical environment – micro-environments
physical environment – tools for movement
physical environment – student choice of environment
physical environment – teacher-directed choice of environment
physical environment – biological needs

educator facilitation - reframe
educator facilitation - recognize
educator facilitation - reduce
educator facilitation – reflect
educator facilitation – respond

relationships – responsive
relationships – co-constructed learning
relationships – two-way student-teacher communication
relationships – individual difference respected
relationships – focus on relationship over activity
relationship – structures environment to encourage interaction
relationship – social and personal development
relationship – focus on positive over negative
relationship – accepts all emotions as ok

social domain
cognitive domain
emotion domain
biological domain
prosocial domain

SELF-REG COMPETENCIES	EMERGING	DEVELOPING	APPLYING	EXTENDING
Step 1: Reframe the Behaviour	Explores examples of excessive stress. Considers the difference between misbehaviour and stress-behaviour.	Recognizes some signs of excessive stress. Recognizes some examples of stress-behaviour.	Reads the signs of excessive stress and reframes the behaviour. Distinguishes between misbehaviour and stress-behaviour.	Reads and reframes behaviour in self and others while applying all of the 5 steps of the Shanker Method™ of Self-Reg.
Step 2: Recognize the Stressors	Understands that there are many different kinds of stressors. Understands that in Self-Reg we look for stressors in 5 different domains: biological, emotion, cognitive, social, and prosocial.	Looks for significant stressors in all of the 5 domains. Understands that stressors from different domains interact with and exacerbate each other.	Identifies significant stressors in all of the 5 domains. Analyzes and describes how stressors from different domains interact with and exacerbate each other.	Identifies and analyzes significant stressors as part of a dynamic 5 domain system in self and others while applying all 5 steps of the Shanker Method™ of Self-Reg.
Step 3: Reduce the Stress	Understands that environments have stressors to an individual's self-regulation and that they can be reduced.	Understands that stressors in all of the 5 domains can be identified and reduced or removed.	Applies strategies to reduce or remove stressors in all of the 5 domains of Self-Reg.	Lowers the stress load experienced by self and others by taking action to reduce and remove identified stressors. This is part of the application of the 5 steps of the Shanker Method™ of Self-Reg.
Step 4: Reflect: Enhance Stress-Awareness	Understands that quiet is not the same thing as calm. Recognizes that many individuals do not know what calm feels.	Begins to notice what "calm" feels like and to recognize genuine calm and some of the other arousal states in self and/or others.	Applies developmentally-appropriate approaches to learn or teach what calm feels like and to become aware of the experience of all the arousal (stress) states.	Applies individual and "whole group appropriate" strategies to enhance stress awareness while applying all of the 5 steps of the Shanker Method™ of Self-Reg.
Step 5: Respond: Develop Personal Strategies to Promote Restoration & Resilience	Understands that strategies to restore energy and to cope with / adapt to stressors is unique for each person. It is not a one-size-fits all process.	Identifies the practices that are restorative to personal energy stores for self or others. Identifies existing adaptive (and maladaptive) coping strategies to respond to excessive stress.	Applies adaptive coping strategies from the personal/individual Self-Reg toolbox kit to respond to excessive stress. Applies personal strategies to restore energy.	Builds own (or supports another to build) a personally meaningful toolbox of Self-Reg strategies to promote restoration and resilience as part of applying all of the 5 steps of the Shanker Method™ of Self-Reg.
"Take it Personally"	Understands that everyone, including parents and teachers, has a limbic system and experiences various arousal states throughout the day.	Reflects on the personal triggers (stressors) played in a stressful situation or an experience with another individual or group. Reflects on personal self-regulatory strengths and areas for growth.	Reflects, during as well as after a stressful experience, on own triggers. Demonstrates awareness of own self-regulatory strengths and areas for ongoing development.	Practices all 5 steps of the Shanker Method™ of Self-Reg.

Appendix J: The MEHRIT Centre Classroom Environment Reflection Tool

The MEHRIT Centre
www.self-reg.ca

SELF-REG

Class Environment Reflection Tool

The MEHRIT Centre, Ltd.

ENVIRONMENTAL CONSIDERATIONS

- ☐ Decluttering walls, bulletin boards, shelves, and furniture particularly instructional areas

  Tip: Make desk size laminated small copies of essential tools for each student that are often displayed on the walls- number and letter lines, etc.

- ☐ Organization of minimal visual material on the walls, shelves, teacher and student work areas into visual groupings

  1) this helps students find information easily

  2) provide at least two different visual environments to allow for taking a visual break such as looking out the window (down regulating) or at an interesting and organized dollar store framed artwork of the students (up regulating)

  Tip: think art gallery in terms of groupings of similar items, simply, tastefully and even colourfully done, for visual pleasure, orientation and to help to grasp the attention of the viewer.

- ☐ Desktop study carrels (three-fold heavy cardboard dividers) to reduce visual input while doing work at their own desks

- ☐ Lighting lessen intensity of florescent lighting (use every other one florescent track, maximize natural lighting) and adjust amount of lighting as needed throughout the day, according to arousal needs of the classroom/ amount of natural lighting available etc.

- ☐ Noise reducing headsets and/or noise eliminating headsets to reduce background noise (make available for all students). Access to ear buds for older students (these do not have to be connected to a device).

- ☐ Have the environmental considerations been explained/taught to students, as needed, such as use of the headphones/study carrels/ visual environments to take a visual break?

MICRO-ENVIRONMENTS

- ☐ A variety of places for students to do their work that can meet a variety of needs (there are many overlaps)
- ☐ To change body position: a counter height table or bookcase, a couch, bean bag chair, and alternatives to sitting such as a standing area, or a bike with an easel, carpet/floor area with clipboards
- ☐ To down regulate or calm: tent – fabric over a desk, a comfortable chair/ couch away from the desks, under a table along the side of the room or a closet with curtains and pillows etc.
- ☐ To reduce visual/auditory stressors (desk or table in hallway, LA room, library etc.)
- ☐ To up regulate (stationary bikes/foot pedals under desks, sit and wiggle)
- ☐ Has the use of the available micro-environments been explicitly taught to your students? Teaching why you might use them and when they may be used during class time.

HYDRATION AND HEALTHY FOOD

- ☐ Do all the students have access to hydration breaks throughout the day and are they encouraged by teacher or education assistant to increase their water intake?
- ☐ Do all the students have access to healthy breakfast, lunch and snacks and if not, how can these be provided?

From Shanker (2012). Calm, Alert and Learning, Pearson: Don Mills, ON

Appendix K: SCEIC Examples

Frequencies of examples observed for each SCEIC item (Physical Environment)

	SCEIC Item	Examples observed	No. of Educators Observed
1	Environment set up to accommodate small or large groups	x's on the floor where to sit (due to COVID)	2
		rows of desks or spread-out table space	5
2	A variety of lighting sources are accessible and flexibly used throughout the day (i.e. natural light, lamps)	fluorescent lights covered with light coloured fabric	1
		fluorescent only	5
		Fluorescent, but a small lamp beside the window which wasn't on nor changed during observation	1
3	A variety of seating options are available	desks or floor seating in assigned spaces	8
4	Different spaces within classroom for multiple purposes that are flexible in the moment	standard desks and tables	5
5	Walls and instructional areas are mostly bare; materials posted are referenced	Something posted on each wall. Example: word wall	4
		None of the wall visuals were referenced other than the SmartBoard	2
		One board for organized group instruction visuals.	1
		bare due to COVID	1
6	Includes quiet area to block out sensory stimulus (i.e. tent, visual block of rest of classroom, headphones) that child can choose to use as needed	No separate area	6
		Al's Place is a small sofa	2
7	Supporting sensory materials are made freely available to all as needed (e.g., exercise balls, exercise mats, squishy balls, noise-cancelling headphones)	None seen	4

		Play Doh in desks for transitions	1
		Available for 2 children with special needs only (materials stored in their cubbies)	1
		Self-regulation table of sensory tools	2
8	Visuals are used to remind children to self-reflect on how they feel and are individualized based on need	None seen	3
		Play Doh in desks for transitions	1
		Available for 2 children with special needs only (materials stored in their cubbies)	1
		Sensory table of tools	2
9	Self-regulation strategies are available for students to use individually (e.g., visual schedule,yoga, breathing exercises)	None taught. Was all literacy and centres. No SR targeted in centres, as there was little to no inte…	4
		Planned class lesson on recognizing feelings in pictures	2
		Class meditation	2
11	Extrinsic rewards are seldom used and are limited to praise / acknowledgement.	Praise for following expectations	8
		Early release from desks for sitting quietly	1
12	Engages child in conversation about his/her arousal levels and what affects them (includes noticing and naming the self-regulation strategies students are using in the moment)	Not discussed nor observed.	1
		How do you feel? Why do you feel that way?	4
		Expectations / rules are given as reminders (i.e. quiet bodies, not supposed to cry)	2
		Compliance observed	4
13	Demands placed on children are responded to with compliance.	Demands to sit not always complied with	1

		"I don't want to do that" response from student	1
		When one student was disengaged, intructions were given to join in.	1
		Ask what happened to guide a solution	2
14	Educator attempts to help the child regulate with calm paraphrasing of what happened (declarative language) and empathy	Praise for doing what was expected	4
		Threat of consequence (work it out or this centre will be closed)	1
		Instructions/reminders of what to do (quiet sitting, 4 students per centre, wash hands, don't clap your shoes, walk quietly in a line)	6
15	Guides students through daily experiences which help them learn what to avoid, what to engage in, to affect one's own regulation	Did via experiences when student was sad (It's ok - what can we do?)	1
		Responsively asked students to work it out themselves (some coaching)	1
17	Proactively (not in response to behaviours) asks students about how their 'engines are running'. Help them learn what it feels like to be calmly focused and alert. Guide child through self-discovery	Instruction / prompt as to where student should be and what they should be doing	4
		Thinkaloud: "This music makes me feel sleepy. Listen to your heart. Is it slowing down?"	1
		Declarative comments: "You look like your body needs to move"	1
		Prompts what to do (quiet body, meditate to calm down). No reflection observed	3
18	Engages in communication with the child before and after self-reg-	No specific SR activities /events observed	2

	based activities and practices to reflect and self-discover		
		Think-aloud about how music makes our hearts beat faster or slower.	1
		Shown how to identify feelings in pictures	1
		Planned movement (Recess, Go Noodle, dance class	6
19	Encourages regular physical activity reflexively (as needed) as well as reflection before and after on how it makes the student feel	Physical activity was not scheduled during this time and all students were encouraged to sit calmly	2
		Structured learning (academic)	3
20	Activities are individualized to allow for individual needs with options for varying physical and cognitive levels	Large group instruction and unstructured centres (some choice of centre)	6
		Clear rules are used in class with reasons why.	1
21	Facilitates children's efforts to take reasonable risks, test their limits, and gain increasing competence and a sense of mastery through active play and social interactions	Clear rules and expectations (posters on wall, stated verbally; where and how to sit, where to be, what not to touch)	7
		Calm voice and demeanor.	3
22	Educator appears regulated him/herself (calm voice, varied affect, engaged with others,)	When class volume went up and there were lots of interruptions, educator looked stressed.	3
		Leaves area to prep when class energy rose	1
		Responsive energy and affect. High affect with class, but got very quiet and gentle with a new quiet child (visibly)	1
24	Goes to child as quickly as possible when upset to coregulate (share their calm)	Didn't notice, or didn't respond to distress unless asked for help directly	1

		Tells student to calm down and have a quiet body	5
		Sees potential conflict and redirects in a calm voice	1
25	Responds calmly to student distress	Calm response with suggested solutions or instructions	4
		High pitched voice and threat of loss of centres when there was noncompliance or interruptions	2
		Follows student who walked away from activity to encourage them to rejoin the activity.	1
26	Responsive student relationships where students are given independence based on their presumed competence	Follow rules to sit, to be quiet, to line up and praise or rewards for compliance	4
		Students encouraged to work independently and helping one another cooperatively as needed (i.e. coats to go outside)	2
27	Acknowledges / responds to / mimics students' non-verbal communication, including facial expressions and tone of voice.	Quiet student whispered her answer and teacher replied in a near whisper during a louder group lesson.	1
		High student arousal appears to deplete teacher energy	2
		Noticed movement and pointed out verbally	3
		High student arousal was responded to with increased rules and verbal statement of expectations	1
28	Uses individualized nonverbal communication effectively (individualized use of eye contact, facial expression, tone of voice, posture, gestures and touch, timing, and intensity of response) to engage students.	Similar with all children. Kind but firm. Clear expectations.	6

		Some variety and this fluctuated by the energy of the child and the activity (song versus learning l…	2
29	Focuses on strengths rather than challenges to build skills	Only commented on unwanted behaviour or too much movement	2
		Praise for skills and knowledge	3
		Engaged with those who needed help sitting and focusing during group	3
30	Helps students to identify feelings and emotions in self and others, discuss why they might be feeling that way, and use words to identify the meaning of their own and others' expressive language	It's ok to feel _____	1
		How are you feeling? Why? (during group instruction)	2
		Using photos to recognize others' emotions with and without masks	1
		Described how we are supposed to be feeling: "We are supposed to be having fun. We aren't supposed to be crying."	1
31	Engages in reciprocal interactions with children where children are both initiators and equal partners	Rules and instructions throughout teacher-led instruction. Little child initiation.	6
		Very reciprocal interactions. Lessons are teacher-directed but are individual for unstructured interactions.	1
		Good educator questions to prompt further learning.	1
32	Models and teaches in the moment the practise of kindness towards other people and all living things, shows concern for their well-being, acts with empathy towards them, and practises including others	Models empathy and kindness with a gentle voice and thinkalouds	3
		Told which proactive skills to use (i.e. say thank-you, follow group numbers limits)	3

33	Bullying, harrassment, and aggression are responded to with connection and empathy (i.e. empathy, hug, space, time as needed)	none seen - the whole group took care of each other	6
		Pushing and high volume - students were removed from preferred centre	2
34	Allows space and time for problem solving, rather than jumping in quickly to prevent problems from occurring	Walks away from conflict to give space but coaches problem solving as needed	4
		Observed escalation (sound or movement) and connected with students who were escalating	2
		Reiterates rules when the volume increased or there was dysregulation.	1
35	Focuses on social and personal development over academic skills	Classroom focus on academics, being calm in order to learn.	6
		Balance of both	1
		Focus on teaching emotion names and letters through watching videos	1
36	Capitalizes on opportunities for one-to-one interactions during daily routines	Almost entirely instructed during group. Few 1:1 interactions.	3

Appendix L: Self-Regulation and Well-Being Frame Expectation

(Ontario Ministry of Education, 2016b)

1. communicate with others in a variety of ways, for a variety of purposes, and in a variety of contexts

1.3 use and interpret gestures, tone of voice, and other non-verbal means to communicate and respond (e.g., respond to non-verbal cues from the educator; vary tone of voice when dramatizing; name feelings and recognize how someone else might be feeling)

1.6 use language (verbal and non-verbal communication) to communicate their thinking, to reflect, and to solve problems

1.8 ask questions for a variety of purposes (e.g., for direction, for assistance, to innovate on an idea, to obtain information, for clarification, for help in understanding something, out of curiosity about something, to make meaning of a new situation) and in different contexts (e.g., during discussions and conversations with peers and adults; before, during, and after read-aloud and shared reading experiences; while exploring the schoolyard or local park; in small groups, in learning areas)

2. demonstrate independence, self-regulation, and a willingness to take responsibility in learning and other endeavours

2.1 demonstrate self-reliance and a sense of responsibility (e.g., make choices and decisions on their own; take care of personal belongings; know when to seek assistance; know how to get materials they need)

2.2 demonstrate a willingness to try new experiences (e.g., experiment with new materials/tools; try out activities in a different learning area; select and persist with things that are challenging; experiment with writing) and to adapt to new situations (e.g., having visitors in the classroom, having a different educator occasionally, going on a field trip, riding the school bus)

2.3 demonstrate self-motivation, initiative, and confidence in their approach to learning by selecting and completing learning tasks (e.g., choose learning tasks independently; try something new; persevere with tasks)

2.4 demonstrate self-control (e.g., be aware of and label their own emotions; accept help to calm down; calm themselves down after being upset) and adapt behaviour to different contexts within the school environment (e.g., follow routines and rules in the classroom, gym, library, playground)

2.5 develop empathy for others, and acknowledge and respond to each other's feelings (e.g., tell an adult when another child is hurt/sick/upset; have an imaginary conversation with a tree or an insect; role-play emotions with dolls and puppets)

3. identify and use social skills in play and other contexts

3.1 act and talk with peers and adults by expressing and accepting positive messages (e.g., use an appropriate tone of voice and gestures; give compliments; give and accept constructive criticism)

3.2 demonstrate the ability to take turns during activity and discussions (e.g., while engaged in play with others; in discussions with peers and adults)

- demonstrate an awareness of ways of making and keeping friends (e.g., sharing, listening, talking, helping, entering into play or joining a group with guidance from the educators)

4. demonstrate an ability to use problem-solving skills in a variety of contexts, including social contexts

4.1 use a variety of strategies to solve problems, including problems arising in social situations (e.g., trial and error, checking and guessing, cross-checking – looking ahead and back to find material to add or remove)

6.0 demonstrate an awareness of their own health and well-being

6.1 demonstrate an understanding of the effects of healthy, active living on the mind and body (e.g., choose a balance of active and quiet activities throughout the day; remember to have a snack; drink water when thirsty)

6.2 investigate the benefits of nutritious foods (e.g., nutritious snacks, healthy meals, foods from various cultures) and explore ways of ensuring healthy eating (e.g., choosing nutritious food for meals and snacks, avoiding foods to which they are allergic)

6.3 practise and discuss appropriate personal hygiene that promotes personal, family, and community health

6.4 discuss what action to take when they feel unsafe or uncomfortable, and when and how to seek assistance in unsafe situations (e.g., acting in response to inappropriate touching; seeking assistance from an adult they know and trust, from 911, or from playground monitors; identifying substances that are harmful to the body)

6.5 discuss and demonstrate in play what makes them happy and unhappy, and why

participate actively and regularly in a variety of activities that require the application of movement concepts

7.1 participate actively in creative movement and other daily physical x

7.2 demonstrate persistence while engaged in activities that require the use of both large and small muscles (e.g., tossing and catching beanbags, skipping, lacing, drawing)

7.3 demonstrate strategies for engaging in cooperative play in a variety of games and activities

8. develop movement skills and concepts as they use their growing bodies to move in a variety of ways and in a variety of contexts

8.1 demonstrate spatial awareness in activities that require the use of large muscles

8.2 demonstrate control of large muscles with and without equipment (e.g., climb and balance on playground equipment; roll, throw, and catch a variety of balls; demonstrate balance and coordination during parachute games; hop, slide, wheel, or gallop in the gym or outdoors

8.3 demonstrate balance, whole-body and hand-eye coordination, and flexibility in movement (e.g., run, jump, and climb; walk on the balance beam; play beach-ball tennis; catch a ball; play hopscotch)

8.4 demonstrate control of small muscles (e.g., use a functional grip when writing) while working in a variety of learning areas (e.g., sand table, water table, visual arts area) and when using a variety of materials or equipment (e.g., using salt trays, stringing beads, painting with paintbrushes, drawing, cutting paper, using a keyboard, using bug viewers, using a mouse, writing with a crayon or pencil)

8.5 demonstrate spatial awareness by doing activities that require the use of small muscles

22. communicate their thoughts and feelings, and their theories and ideas, through various art forms

22.1 communicate their ideas about something (e.g., a book, the meaning of a word, an event or an experience, a mathematical pattern, a motion or movement) through music, drama, dance, and/or the visual arts