Intensive Intervention Practice Guide:

Teaching Self-Regulation Skills to Students With Disabilities (K-12)

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What Is It?

Self-regulation is a set of abilities and skills that allow an individual to adjust their emotions, behaviors, and cognitions to meet demands (Edossa et al., 2018; McClelland et al., 2010). These sets of skills are obtained over an individual's lifespan, but the acquisition of these skills is highly regarded in early childhood (Blair & Diamond, 2008) and is a predictor of academic achievement (Blair, 2003; Valiente et al., 2010). Students use self-regulation through several methods to monitor, manage, and assess both their behavior and academic achievement (Reid et al., 2005). Executive functions (i.e., adaptable thinking, planning, self-monitoring, self-control, working memory, time management, and organization) contribute largely to self-regulation, thus requiring skills, strategies, and interventions to successfully utilize self-regulation to obtain academic and behavior achievement (Pandey et al., 2018).

Self-regulation is a large psychological umbrella that includes a wide range of strategies, skills, and cognitive processes appropriate for all ages and abilities. Edossa et al. (2018) identify three essential domains within self-regulation (1) emotional self-regulation (e.g., social skills), (2) behavioral self-regulation (e.g., self-management), and (3) cognitive self-regulation (e.g., self-regulated strategies). Broadly, this practice guide addresses emotional and behavioral self-regulation development in students within the context of family systems and examines the contribution of cultural influences. Additionally, evidence supports teaching these skills together rather than as independent domains (Edossa et al., 2018; Trentacosa & Izard, 2007).

Emotional Self-Regulation

Emotional self-regulation consists of identifying and responding to emotions within the self to appropriately manage your individual response (Houseman, 2017; McClelland et al., 2007). Some examples of emotional self-regulation might include taking a walk, directing attention and thoughts to positive things, "robot to ragdoll" (progressive relaxation), or using grounding practices such as naming five things you see in the room. Emotional self-regulation can be used to bring energy down or to increase energy to match the needs of the situation. Emotional self-regulation is a critical skill to support learning, and there is a strong research base to suggest that students in kindergarten with strong emotional regulation skills are positively correlated to having strong math and literacy abilities (Blair & Razza, 2007).

Behavioral Self-Regulation

Where emotional self-regulation focuses on the internal, emotional process, behavioral self-regulation focuses on external strategies that allow individuals to better manage their behavior (Vohs & Baumeister, 2004). One example of behavior self-regulation is intentionally targeting motivation as it relates to executive functioning, behavior, academics, etc. Students who are skilled at behavior self-regulation strategies can effectively complete tasks, prioritize their workload, and maintain sustained effort on difficult tasks. Other examples of behavioral self-regulation include goal setting, self-monitoring progress towards that goal, or self-instruction. For example, students may have short-term or long-term goals that are developed by themselves or with the help of teachers and their family. The use of a self-monitoring system, such as a daily checklist, to monitor the student's progress in relation to the goal increases self-determination skills and ownership. Behavioral self-regulation is especially essential for success in elementary grades, as it often acts as a foundation for academic achievement later (McClelland et al., 2007).

For Whom Is It Intended?

Teaching self-regulation skills is beneficial for students of all ages and abilities but is especially impactful for students who have been exposed to trauma and are more likely to lack the skills to self-regulate (Blair & Raver, 2012). When exposed to chronic stress, the neurodevelopment of emotional regulation, reactivity, and executive functioning skills are impeded (Shin et al., 2018). Therefore, students who have exposure to traumatic events may require explicit and intensive support to teach and maintain self-regulation skills.

Self-regulation is beneficial for students with disabilities who have difficulty with self-regulatory processes resulting in poor academic, behavioral, and social outcomes (Schunk & Zimmerman, 2012). While students with learning difficulties and disabilities may have comorbid difficulties across self-regulatory processes, there are known skills that are impacted by certain disabilities. For example, students with attention-deficit hyperactivity disorder (ADHD) and emotional behavioral disorders (EBD) may have increased difficulty with self-regulation of attention skills (Reid et al., 2005), and students with specific language impairment (SLI), learning disabilities (LD), autism spectrum disorder (ASD), developmental delay (DD), and intellectual disability (ID) may have increased difficulty with self-regulation skills related to communication (i.e., oral and written language; Reid et al., 2005). Even though there is a large research base on effective practices and strategies regarding self-regulation for students with disabilities, it is important to evaluate and make decisions on an individualized level.

How Does It Work?

Self-regulated learning can be challenging for students due to competing activities, insufficient knowledge, difficulty judging the quality of learning, and insufficient incentives (Zimmerman & Moylan, 2009). These difficulties regarding self-awareness, motivation, attention, and retention guide the three psychological processes that play critical roles in self-regulation such as (1) metacognition which impacts a student's awareness of demands, capabilities, and strategies needed to successfully carry out tasks; (2) self-efficacy referring to the individual's belief whether or not they can successfully perform an activity or task; and (3) motivation or one's general desire or willingness to do something (Reid et al., 2012; Zimmerman & Moylan, 2009).

Theories around self-regulation have developed over the years. One describes a cyclical phase model of self-regulation focusing on a personal feedback loop of information from an individual's performance and outcomes that drive changes and adaptations (Hattie & Timperley, 2007; Zimmerman & Moylan, 2009). This model is detailed in Figure 1. The three phases include the (a) forethought phase, (b) performance phase, and (c) self-reflection phase. The forethought phase refers to processes preceding learning and is composed of task analysis processes and self-motivation. The second phase of this self-regulation model, the performance phase, occurs during learning and involves the use of self-control and self-observation. Lastly, the self-reflection phase consists of self-judgment and self-reaction. The self-reflection phase influences the forethought phase, thus continuing the cycle of self-regulation (Zimmerman & Moylan, 2009). Within this model, students use different self-regulation strategies (e.g., goal setting, self-evaluation, and time management) to successfully move throughout the phases, thus achieving self-regulation.

Strategies

There are a wide variety of strategies to improve self-regulation skills for students of all ages and abilities. Common behavioral self-regulation processes, especially for students with LD and ADHD, include self-monitoring, self-evaluation, self-instruction, goal-setting, and self-reinforcement (Reid et al., 2012). Wyman et al. (2010) outline several evidence-based emotional self-regulation processes for this population: (a) skills for maintaining an equilibrium of emotions, which includes deep breathing or taking space; (b) self-control to reduce escalation of emotions, which could look like using a "feelings thermometer" that demonstrates the intensity of an emotion; and (c) self-monitoring of emotions, which can include a 'feelings check-in' and ties into the behavioral self-regulation strategy of self-monitoring.

How Can Families Support Implementation?

Parents, caregivers, guardians, and other family members play a significant role in the development of children's self-regulation skills. Educators can work closely with families to develop strategies that incorporate smoothly into the home setting and vice versa. For students of all ages, emotional support from family members and encouraging independence in the home learning environment can facilitate self-regulation development (Stright et al., 2001). These two factors allow children to develop a sense of personal competence, which, in turn, encourages self-regulatory emotional and behavioral skills. Emotional support and expectations for independence during childhood can look very different across cultures, so schools should ask families what these two things might look like in their cultures. Promoting the generalization of self-regulation skills can be done across all age groups for students with disabilities by having intentional discussions during Individualized Education Program (IEP) meetings to brainstorm strategies that may work across settings (e.g., school, home, and public settings) and to include self-regulation goals in IEPs where appropriate.

Elementary School

When considering self-regulation support from families from ages 5 to 10, it's important to differentiate compliance from self-regulation. Compliance, such as a child working on their math homework when asked, is different from self-regulation, where a child sets a goal to complete five math problems independently and does so without the adult demand in place. Parents who work to facilitate self-regulation skills support the development of children's independence and initiative (Grolnick and Farkas, 2002). For students in elementary school, important self-regulation behaviors include the ability to listen to an adult's instructions and seek help when they do not understand, the ability to check their work or self-correct, and their ability to remain involved in discussions (e.g., talking with classmates, participating in whole group and small group discussions, and collaborating with peers; Stright et al., 2001).

Parents can support attending to instruction by presenting directions to their children in ways that are organized and at a pace they can comprehend. This teaches the child that directions are worth listening to because directions that are presented in a way that can be understood are more likely to be proved useful. Therefore, this indicates to the child that there is value to the direction itself (Grusec & Goodnow, 1994). If comprehension of instructions proves to be an area of difficulty, parents can attempt to find other ways to provide instruction; for example, by using a visual schedule to provide a visual prompt of the next step. If these alternative methods mirror those

that are used in the classroom or vice versa, then there will be an increase for ease of knowledge transfer between different environments, situations, and settings.

Parents can provide support for self-monitoring, a behavioral regulation skill, by establishing routines at home. For example, scheduling time to work on homework, helping the child make a list of tasks that they need to complete, or simply asking them what they think the answer might be when they ask a question before providing help. These are all strategies that foster student's ability to develop self-monitoring tools.

Additionally, parents can encourage participation in the classroom in several different ways at home. First, they can help provide words for feelings that may occur when the child needs to speak in front of others (e.g., excitement, shyness, nervousness). They can also encourage the child to identify those emotions themselves and identify strategies and tools that help regulate these emotions (e.g., deep breathing, taking a break). Next, they can support the actual practice in several ways. One way that can be easily incorporated into the family's daily routine is having group conversations (i.e., this can occur at the dinner table, out at a restaurant, or driving in the car). Engaging in conversations as a family provides an opportunity for the child to practice sharing their thoughts and opinions, practicing listening skills, articulating ideas and thoughts, and self-reflecting.

Another example of ways to support self-regulation at home includes using a parent implemented Check-in/Check-Out (CICO) system. CICO is a system that promotes structured feedback from teachers or families. This system encourages children to engage in self-reflection by identifying behaviors that the child needs support with paired with multiple opportunities to reflect on these behaviors throughout the day. This allows the child to examine how they are feeling emotionally and recognize how their feelings are influencing their behaviors.

In the case of an in-school CICO system, a student with difficulty with impulse control may have the goal of "Be Respectful" on their CICO chart to encourage them to raise their hand to share out with the class rather than speaking without being called on. It is important to ensure that the broad school-wide expectation ("Be Respectful") is clearly defined as an adaptive behavior for the student. For example, the student may require explicit language such as "Raise your hand to share with the class" and practice.

In schools at certain time points throughout the day, students will check in with a teacher, paraeducator, or other trusted staff member to reflect on their performance on those goals. This could easily be adapted to the home setting by targeting skills such as "Be Kind," or, more explicitly, "Use kind words with your sister". These charts can be shared between home and the

classroom to encourage similar behavioral expectations across settings. CICO can be a helpful tool for parents to celebrate and reinforce their child's successes as well as provide them with specific feedback about any challenges that occurred throughout the day.

Middle and High School

Middle and high school students need to learn and practice emotional regulation skills as social interactions become increasingly complex and intense (McCraty et al., 1999). During middle and early high school, the brain systems that allow adolescents to process emotions and seek out positive reinforcement are more developed than those that control responsible decision-making or take possible future consequences into account (Murray & Rosanbalm, 2017). Due to this imbalance, it can be challenging for families to find opportunities to support their children in developing independence in a way that is supportive but also allows independence.

Families can support their children in much the same way they did when they were younger; model self-regulation skills, structure the home environment, and provide a safe and supportive relationship for your child (Murray & Rosanbalm, 2017). In practice, this can look like outlining natural consequences for actions and modeling behaviors that demonstrate intentionality as it relates to "taking a break" or walking away and disengaging from a negative or heightened interaction. Furthermore, using that time to take deep breaths and self-reflect, ultimately, demonstrating how to de-escalate and self-regulate during moments of emotional intensity.

Lastly, educators can collaborate with families to identify strengths and interests observed both in school and at home. Based on the identified strengths and interests, the teacher can use that information to help inform IEP goals and identify strategies for positively engaging students both at home and in the classroom. In a school context, the IEP might include a "Social Skills" service in which the student is assigned 15 service minutes and those minutes can be used to "Check-In" with their case manager throughout the day. During the 5-minute Check-Ins, the teacher may help support the student as they process moments of dysregulation throughout the day.

Cultural Considerations

There is no question that the impact of family systems on children's development of self-regulation is substantial. Despite this well-established understanding, most of the literature on family systems and self-regulation development has centralized the focus on White and Caucasian families. However, evidence suggests cross-cultural differences impact children's self-regulation, and these differences are consistent with cultural expectations, values, beliefs, and norms within family systems (Chen, 2016; Lavelli et al., 2019; Schore, 2001; Thompson et al., 2013). Culture,

in this context, refers to a social construct that serves to describe groups of individuals with shared commonalities, including shared beliefs, norms, and values (Chen, 2016).

Parenting practices and socializing practices often reflect differences in cultural expectations, values, beliefs, and norms. In fact, evidence suggests cultural norms influence the following parenting practices, behaviors, and expectations: (a) the beliefs and values parents teach their children, (b) their understanding of behavior, (c) how they evaluate and respond to their child's behavior, (d) behaviors they perceive to be appropriate, (e) the ways in which they model emotional and behavioral regulation, as well as (f) methods they use to teach emotional behavioral strategies (Chen, 2016; Lavelli et al., 2019; Schore, 2001; Thompson et al., 2013). Ultimately, children develop strategies for self-regulation in the context of parenting, as parents teach and model emotion and behavior management and display rules of the culture.

To leverage parental involvement to support student self-regulation, fostering meaningful, respectful, and collaborative teacher-parent relationships is a necessary endeavor. This sentiment was confirmed in a study that demonstrated high-quality, positive parent-teacher relationships are associated with fewer self-regulation problems in students (Zulauf-McCurdy & Loomis, 2022). Unfortunately, positive parent-teacher relationships are often not the reality for many parents. Parents from historically marginalized and oppressed groups often face many systemic and structural barriers that impact how they engage and navigate the relationship with their child's school. According to Zulauf-McCurdy & Loomis (2022), barriers include racism in schools (e.g., staff, teachers, administration, school policies, etc.), cultural dissonance, language differences, and more importantly, incongruence between their cultural norms and beliefs and practices at school.

Thus, it is crucial that practitioners are knowledgeable and able to recognize culturally normative patterns of parent socialization and student self-regulation to identify and better understand both families and students. More importantly, intervention efforts should focus on strategies that empower both parents and teachers to develop positive parent-teacher relationships. For example, the following strategies can be used to foster positive parent-teacher relationships and promote self-regulation development in the student: (a) emphasizing positive news; (b) amplify student voice and parent voice; (c) rather than involving parents based on the dominant view of 'involvement' (e.g., volunteering, fund-raising, discipline at home, homework completion), allow parents to identify ways they want to be involved; and (d) reframe expertise by providing opportunities for parents to engage meaningfully in the IEP process (e.g., parental involvement in goal-setting; Ishimaru & Takahashi, 2017).

How Adequate Is the Research Knowledge Base?

The well-established literature on self-regulation in the past 20 years has largely focused on theories, effective strategies, and the development of curricula to support and teach self-regulation skills. Research exists cross-functionally, with studies across Special Education, Psychology, Social Work, and other fields demonstrating the impacts of teaching and practicing self-regulation strategies in academic settings and with diverse populations. Within education, there is a strong evidence base for the link between self-regulation skills and student academics. More importantly, evidence suggests that students with disabilities can use self-regulation skills with moderate-to-high effectiveness in school settings (McDougall et al., 2017).

In fact, one of the most challenging aspects of determining the strength of the research base comes not from a dearth of research, but the sheer volume; because there are so many strategies and studies, it can be difficult to determine which programs are based in strong evidence. To develop this practice guide, we reviewed several meta-analyses and literature across the fields of psychology and special education and distilled this information to include the recommendations provided within. We summarized various resources here for parents and teachers with limited time.

How Practical Is It?

Teaching emotional and behavioral self-regulation can be easily integrated into the classroom in a variety of ways including through tier 1 instruction, tier 2, and tier 3 intensive interventions, integrating supports within academic instruction, and peer-mediated supports.

Tier 1 Curricula

Stand-alone curricula that can be implemented through tier 1 instruction, such as Caring Schools Community from Collaborative Classroom, offer materials and include a scope and sequence for teachers to implement in the classroom and includes routines such as morning meetings. When looking for a tier 1 self-regulation curriculum, as with any program, it is important to ensure that the program includes a scope and sequence, teaching materials, and has evidence to support its efficacy. What Works Clearinghouse has quick access to research on a wide range of academic and behavioral programs, such as a guide on “Reducing Behavior Problems in the Elementary School Classroom”. These guides can be found under the “Practice Guide” section of the website. Additional tier 1 curricula that target self-regulation strategies include I Control and STAR and have shown to be effective in supporting students with self-regulation skills.

Tier 2 and Tier 3 Interventions

For students that need more intensive support with self-regulation, these skills can be taught in small groups and one-on-one settings by a range of adults including classroom teachers, special educators, school counselors, or paraeducators. Additionally, students with disabilities who have IEPs should be involved in tiers 1, 2 and 3 support. Programs such as The Zones of Regulation and Skills Streaming teach students to identify and recognize their emotions (i.e., the red zone includes anger, the yellow zone includes silly and frustration, the green zone includes happiness and calm, and the blue zone includes sad and tired) and explicitly teach expected behaviors (e.g., social skills instruction). Other supports, such as CICO are free and can result in reductions in challenging behaviors when implemented as a tier 2 intervention (Campbell & Anderson, 2011).

Integrating Supports

Self-regulation strategies can be easily integrated within academic instruction using group contingency plans, token economies, CICO systems, and self-monitoring strategies. Both group contingency plans and token economies teach students behavioral expectations which are immediately reinforced by awarding points or a token of some kind in exchange for an earned reward. Group contingency plans can be used with a whole classroom or small group, while token economies are easily implemented with small groups or individually (Ivy et al., 2017). Both are effective in reducing challenging behaviors and increasing expected behaviors (Thorne & Kamps, 2008).

How Effective Is It?

Research done on teaching students self-regulation strategies suggests that it is an effective method of increasing self-regulation skills in students' pre-k through high school. A meta-analysis of 50 self-regulation interventions including a total of 23,098 participants found overall positive effects on participants' self-regulation skills (Pandey et al., 2018). Interventions included in this meta-analysis were categorized into curriculum-based interventions, physical activity/exercise-based interventions, mindfulness/yoga interventions, family-based interventions, and other social and personal skills interventions, and all studies included randomized control trials. Examples of studies included in the meta-analysis can be found in Table 1. Of the 50 interventions included in the study, 66% reported improved outcomes on measures of self-regulation. Subgroups of interventions (i.e., curriculum-based interventions, yoga and mindfulness interventions, social and personal skills intervention, and exercise-based interventions had average effect sizes of 0.34, 0.44, 0.64, and 0.46, respectively. Therefore, schools can anticipate having small to moderate effects for curriculum-based interventions, yoga and mindfulness interventions, and exercise-based interventions, and medium effects for social and personal skills interventions.

Another meta-analysis of 41 interventions targeting self-control (defined as impulse control) found an overall positive effect on improving measures of participants' self-control (Piquero et al., 2016). Most of the studies included had positive effect sizes, and the overall mean effect size was .32, which is positively statistically significant. Therefore, early intervention and explicit teaching of self-regulation skills have significant impacts on improving self-control and reducing delinquency. Studies with positive effects included interventions such as social skills development (i.e., focusing on communication, friendships, problem-solving, and emotional regulation), cognitive coping strategies, and self-control improvement using role-playing.

Additional studies have found self-regulation instruction to be effective with students with more significant behavioral challenges across settings. Thompson (2014) found the implementation of the Self-Management Training and Regulation Strategies (STARS) program with 4th and 5th grade students led to decreased teacher ratings of student disruptive behavior. Students with severe behavioral challenges in self-contained classrooms had more positive scores on teacher rating scales of executive functioning, general problem solving, and higher student-reported scales of emotional control and self-regulation after the implementation of the I Control curriculum (Smith et al., 2017).

What Questions Remain?

While self-regulation is a well-researched area, questions remain regarding adaptations to strategies across age groups and measurements of effectiveness.

Self-Regulation Across Age Groups and Populations

- What are the most effective self-regulation strategies for students who are minimally vocal?
- How can we effectively incorporate student voice and choice in the selection of self-regulation strategies?
- When should student preference for self-regulation strategies be assessed and re-assessed?
- How can self-regulation teaching programs be used as a replacement for school discipline? Is self-regulation an acceptable replacement for school-based punishment procedures?
- What methods are most effective for transferring home or school-based self-regulation programs to other settings?

Measurements of Effectiveness

Most students are exposed to a couple of self-regulation strategies (e.g., deep breathing), but there is a lack of evaluation within the school system if these strategies work for the individual. Future recommendations of research include the evaluation of self-regulation interventions (i.e., academic, behavior, and social skills) for students with disabilities through a multi-tiered system of support (MTSS).

- What measurement tools can be used to evaluate the effectiveness of self-regulation strategies for an individual?
- What practices improve the sustainability of utilizing self-regulation strategies?

Where Can I Learn More?

Listed below are resources that can provide information on self-regulation. Additional information can be found in the reference section at the end of this practice guide.

- **What Works Clearinghouse Intervention Report Re: Social Skills Training**
  https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_socialskills_020513.pdf
- **Office of Planning, Research, & Evaluation; An Office of the Administration for Children & Families** *Self-Regulation and Toxic Stress Series*
  https://www.acf.hhs.gov/opre/project/self-regulation-and-toxic-stress-series

Parent and Child Resources and Videos

- **Victoria State Government; Education and Training**
  https://www.education.vic.gov.au/school/teachers/profdev/Pages/help-children-self-regulate.aspx
- **The Gottman Institute**
  https://www.gottman.com/blog/age-age-guide-helping-kids-manage-emotions/
- **PBS Kids – For Parents**
  https://www.pbs.org/parents/learn-grow/age-6/emotions-self-awareness/self-awareness
- **Sesame Street; Feelings and Emotions**
  https://www.youtube.com/playlist?list=PLQJaFRtaBs0rE0IHegX8Grq2lMjkJSbKL
- **Child Mind Institute**
  https://childmind.org/article/can-help-kids-self-regulation/

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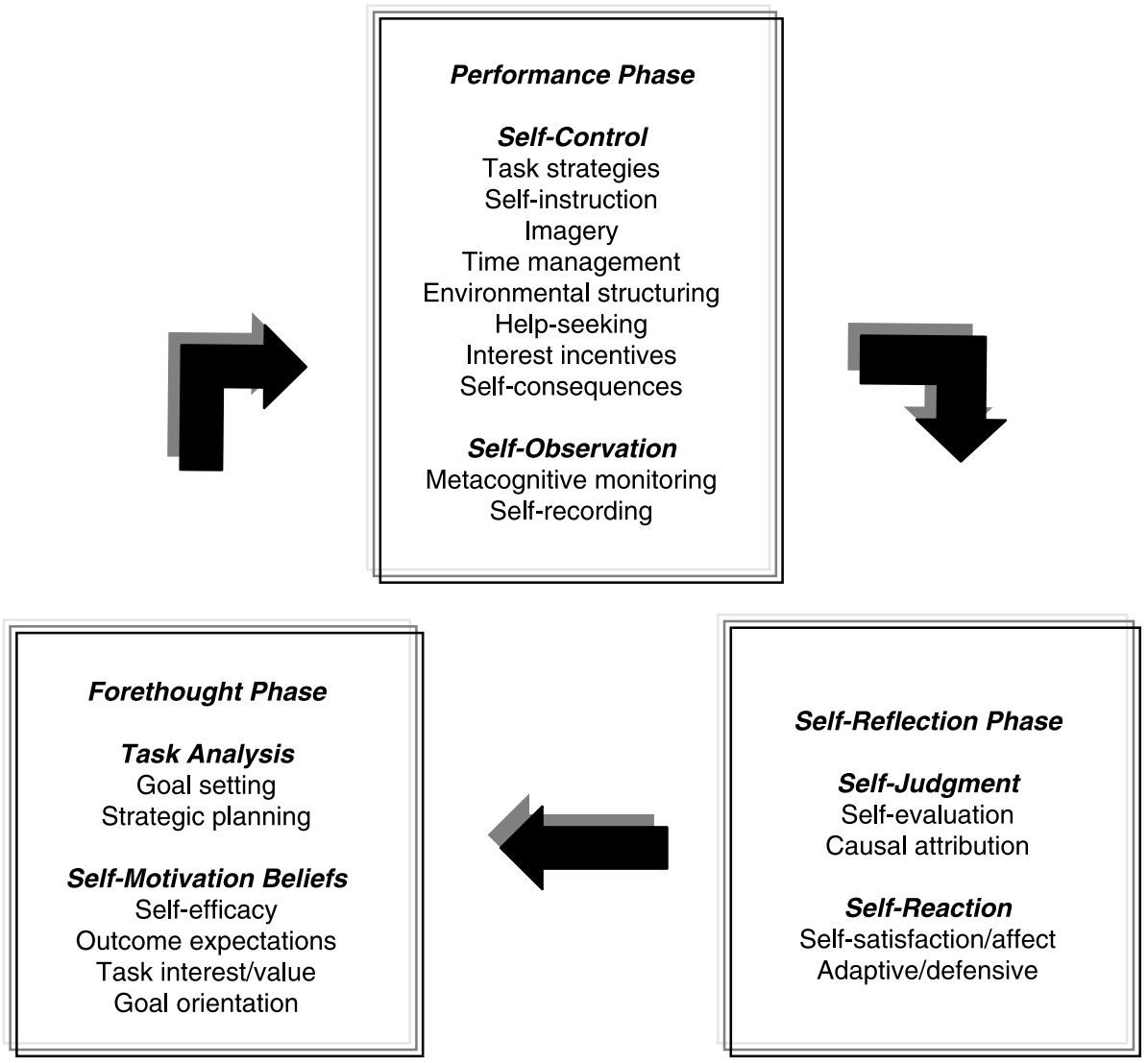
Figure 1

A Cyclical Phase Model of Self-regulation That Integrates Metacognitive Processes and Key Measures of Motivation



Note. Reprinted from "*Handbook of Metacognition in Education,*" by Zimmerman & Moylan, 2009, p. 300, New York, NY: Routledge.

Table 1

Sample of Research Evidence for Self-Regulation

Study	Research Design	Sample	Intervention	Outcomes	Findings
Raver et al. (2011)	Pre-post experimental design; Two treatment groups • CSRP intervention • Control (BAU)	602 children in head-start funded classrooms	Curriculum-based intervention (i.e., Chicago School Readiness Program; CSRP)	Self-regulation skills; (1) executive functioning, (2) effort control, (3) and attention/ impulsivity	Improved self-regulation skills is hypothesized as a potential mediator for gains in academic readiness. Respectively, ES = 0.37, 0.20, 0.43
Flook et al., 2010	Pre-post experimental design; Two treatment groups: • MAPs intervention • Control (BAU)	64 second and third grade children from Los Angeles, California	Yoga and mindfulness intervention (i.e., Mindful Awareness Practices (MAPs) school-based program)	Executive functioning	MAPs had positive effects on self-regulation skills. Results show that students with self-regulation difficulties show greater improvements in their executive functioning with this intervention. ES = .30
Volckaert and Noël, (2015)	Pre-post experimental design; Two treatment groups: • Cognitive intervention • Control (BAU)	47 typically developing children (14 boys, 33 girls) in a preschool class in Belgium	Social and personal skills intervention	• Executive functions • Behavioral changes	Children receiving cognitive intervention performed better on inhibition, attention, and working memory measures. ES = .55
Lakes & Hoyt (2004)	Pre-post experimental design; • Martial arts intervention • Control; traditional physical education	207 kindergarten – 5th grade students (94 boys, 99 girls)	Exercise-based intervention (i.e., school-based Tae Kwon Do training)	Self-regulatory abilities (cognitive affective, and physical)	Students in the Tae Kwon Do group demonstrated improvements in self-regulation and behaviors. Male participants demonstrated significantly greater gains than female participants. ES = .50

Note. Studies retrieved from a meta-analysis of effective self-regulation-based interventions (Pandey et al., 2018).