Research Guide (Grades PreK–6)
College and Career Competency: *Self-Regulation*

Definition:

Self-regulation refers to "a proactive, self-directed process for attaining goals, learning skills, managing emotional reactions, and accomplishing tasks" (Gaumer Erickson & Noonan, 2022d, p.1). Self-regulated students are "metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 1986, as cited in Zimmerman, 2008, p. 167). The self-regulation process can be defined as making a plan, monitoring that plan, adjusting to stay on track, and reflecting on what worked and what could be improved the next time (Gaumer Erickson & Noonan, 2016).

Essential Components for Students:

1. Plan for and articulate what you want to accomplish.
2. Immediately monitor progress and interference regarding your plan.
3. Adjust as needed when things are not going as planned.
4. Reflect on what worked and what you can do better next time.

Competency Sequence for Students:

These targets describe how students demonstrate competency knowledge (Noonan & Gaumer Erickson, 2018). As outlined in the Assessments section, these targets can be used to determine students' growth over time through a performance-based observation process.

	Self-Regulation
Beginning	• Demonstrates the ability to create a simple plan and immediately reflect on the implemented plan. • Describes and chooses simple strategies for self-calming. • Plans and practices ignoring some distractions during a task, resulting in increased focus.
Emerging	• Demonstrates the ability to create a plan to accomplish a task or set of tasks. • Follows multistep, teacher-created plans. • Identifies ways to get back on track when distracted. • Develops a plan (with teacher guidance) to self-regulate for common challenging situations and emotional reactions. • Predicts how various actions/decisions would affect outcomes.
Proficient	• Describes self-regulation components (i.e., plan, monitor, adjust as needed, and reflect). • Explains self-regulation strengths and areas for improvement related to specific situations (e.g., assignments, technology, social interactions). • Demonstrates the ability to make increasingly detailed plans to accomplish tasks. • Identifies potential barriers to plan completion using if–then statements. • Monitors progress of efforts over time. • Reflects on success of effort.

Research:

- In a meta-analysis of 61 studies, Dent and Koenka (2016) found that for each grade level (kindergarten–12th grade), academic performance is significantly correlated with self-regulation. As noted by the researchers:

  > Planning allows students to chart a course for academic tasks while self-monitoring and self-control allow them to maintain it. When self-monitoring alerts students to a discrepancy between task performance and a learning or achievement goal, self-control enables them to resolve it. This flexible approach is associated with, and may be necessary for, better performance on both complex and less structured academic tasks. (p. 459)

- In a meta-analysis of 48 elementary self-regulation programs, researchers found that training elementary school students in self-regulation has a positive effect on learning outcomes, cognitive and metacognitive strategy use, and motivation (Dignath et al., 2008). Across grades 1–6, the highest effects were in mathematics and reading/writing achievement.
- In research involving 81 fifth graders, Kitsantas et al. (2009) found that self-regulatory strategies contribute to elementary student achievement. "The only variable that consistently predicted GPA across all subject areas was self-regulated strategies" (Kitsantas et al., 2009, p. 76). They note that students can develop self-regulation through counselling interventions of six to eight students, where students discuss goals and behaviors that would contribute to those goals.
- Backer-Grøndahl et al. (2019) tested hot and cool forms of self-regulation for their ability to predict student academic competence and maladjustment. "Hot" self-regulation refers to emotional control, while "cold" refers to what is more traditionally thought of as executive function. Although other researchers have argued that there is overlap between hot and cool, rendering them inexact, Backer-Grøndahl et al. have found that the labels are a good heuristic, inasmuch as they help conceptualize different aspects of self-regulation. The authors found that both hot and cool self-regulation predicted student academic competence but that only hot self-regulation predicted student maladjustment.
- In research on self-regulation for preschoolers, Goodwin and Miller (2013) reported that 3- and 4-year-olds learned to self-regulate and manage their behavior when their preschool program encouraged them to select and plan their own activities.
- Researchers in Canada (Piché et al., 2015) studied how self-regulation skills and behaviors developed in kindergarten could impact students 4 years later. They found that kindergarten self-regulation related to classroom engagement and participation in sports by fourth grade. The researchers concluded that it is important to intervene early to build self-regulation skills.
- Several studies have shown that teachers can successfully adapt activities and assignments to help students develop self-regulatory skills.
  - In a study involving fourth-grade math instruction in Germany, students who were trained in self-regulated learning by the teacher showed significant increases in both homework effectiveness and math achievement (Zimmerman, 2008).
  - Embedding student self-graphing into classroom tasks has been shown to increase students' ability to self-regulate their learning (Hirsch et al., 2013).
- Muis et al. (2016) examined the impact of using a self-regulatory process on students aged 11. In the study, 78 elementary students were assigned to one of two conditions—learning by preparing to teach (experimental group) or learning for learning (control group). They found that in the experimental group, students applied self-regulatory processes as they solved the problem, in part because they were required to then teach others. More specifically, the experimental group applied task definition (identifying the conditions around solving the problem), hypothesizing what would happen during each step of the problem-solving process,

and determining how to coordinate information sources and making inferences as they worked on the problem. The students in the experimental group had better outcomes (i.e., a more detailed and better-organized concept map) than students in the control group. The students who were charged with teaching others applied self-regulation strategies to a higher degree than those who were solving the problem to complete a task.

- When it came to learning fractions, third-grade students who had received self-regulation instruction outperformed a control group who had not received the instruction (Wang et al., 2019). Although students who underwent the self-regulation training received explicit instruction only in fractions, they had the added benefit of recognizing other math skills they needed to improve on, like multiplication. Through assessment and reflection of their learning processes, the students were able to acknowledge skills that they lacked and to improve these skills, strengthening the scaffolding underlying their ability to do fractions.
- Children, youth, and adults who demonstrate effective emotional regulation strategies have improved relationships, increased academic achievement, and decreased risk for anxiety and depression (Aldao et al., 2010).
- In a study of children aged 8–12 with fetal alcohol spectrum disorder (FASD), 12 weekly 1½-hour sessions of the Alert Program for Self-Regulation were found to increase gray matter in the brain (specifically the left middle frontal gyrus, right frontal pole, and right anterior cingulate). Neither the control group of children with FASD nor the control group of children without FASD showed changes in their brain scans (Soh et al., 2015).
- Students' self-regulation in relation to digital environments is contextual (McNaughton et al., 2022). High frequencies of fun digital activities are inversely related to students' self-ratings of self-regulation, whereas parents' monitoring correlates with high ratings of self-regulation. Despite the potential for students to become distracted, devices are important because they allow students to socialize. Students therefore need to learn context-specific strategies to self-regulate their time with devices.
- In a review of 49 self-regulation interventions, Pandey et al. (2018) found that, despite different forms of intervention (e.g., curriculum, community, or exercise based), most worked. The authors also found that self-regulation scores improved across all age groups, with no age group scoring higher than others. Despite most studies being conducted in the United States, they showed racial and economic diversity.
- A study from Johns Hopkins University (Carlos Núñez et al., 2022) found that students in grades 3 and 4 who learned self-regulation strategies outperformed the control group on measures of self-regulated learning (ES = +0.77) and reading comprehension (ES = +1.21). The authors recommend embedding the explicit teaching of self-regulation strategies within content instruction to improve learner autonomy and academic achievement.

Assessments:

- The self-regulation formative questionnaires are self-report measures that ask students to rate behaviors on Likert-type scales. Accommodations should be provided when appropriate and may include reading the items aloud, explaining the items, and having a scribe fill in the response option. These questionnaires should not be used as a pre/post measure. As students learn more about self-regulation, their internal frame of reference may shift, causing them to become more critical in their self-assessment; this phenomenon is called response shift bias (Bray et al., 1984; Drennan & Hyde, 2008). Two self-regulation questionnaires promote students' reflection in kindergarten through second grade and third through sixth grade.

  - The Self-Regulation Questionnaire (K–2) (Heger et al., 2022b) asks students to respond to six items using emojis for *Like Me*, *Not Sure*, and *Not Like Me*. In most instances, this questionnaire should be read aloud to students. Two example items follow:
    - When I have things to do, I know how to get started.
    - I can calm myself when I have big feelings.
  - The Self-Regulation Questionnaire (3–6) (Heger et al., 2022c) asks students to respond to 19 items on a 5-point Likert-type scale from *Not Very Like Me* to *Very Like Me*. Two example items follow:
    - I plan out projects that I want to complete.
    - I have a plan for calming myself when I'm mad.

  Results are immediately available for reflection. Teachers can access the questionnaires by setting up an account at https://www.cccstudent.org/ and following the instructions to create an assessment and administer it to students. Students (and teachers) can use individual questionnaire results to identify self-regulation strategies that students can focus on cultivating or strengthening.
- The Self-Regulation Knowledge Test (3–6) (Heger et al., 2022a) includes 15 items. It is a curriculum-based measure that assesses students' knowledge of self-regulation constructs and judgement of the most effective course of action when applying these constructs. The test includes multiple-choice, yes/no, true/false, situational judgement, and short-answer items. The following are a few example items:
  - Choose the best description of self-regulation.
    a. When you plan for how to reach a goal, learn a skill, or accomplish a task.
    b. When you plan, monitor, adjust, and reflect to reach a goal, learn a skill, or accomplish a task.
    c. When you follow your teacher's detailed directions for reaching a goal, learning a skill, or accomplishing a task.
    d. When you make progress toward reaching a goal, learning a skill, or accomplishing a task.
  - True or false: Self-regulation is important for school, but it doesn't help improve athletic or musical ability.
  - Imagine that you are struggling to learn a skill in math. How could you self-regulate to improve your learning?

  The knowledge test is directly aligned with *Teaching Self-Regulation in Elementary Classrooms 3–6* (Heger et al., 2022e; see the first item under Instructional Practices, below), available for purchase at https://www.cccframework.org/competency-lessons-and-student-workbooks/. The test can be used as a pre/post measure prior to and after teaching the self-regulation lessons. Accommodations should be provided when appropriate and may include reading the items aloud, explaining the items, or having a scribe fill in the response option. Once students have completed the knowledge test on https://www.cccstudent.org/, teachers can view graphed results for individual students and aggregate results for all their students. Teachers can also download a raw data file.
- The Self-Regulation Performance-Based Observation (Gaumer Erickson & Noonan, 2022b) is designed to be embedded within authentic situations such as academic courses and extracurricular activities. The Self-Regulation Performance-Based Observation can be used at purposeful intervals to monitor each student's development. Based on observations across time or in specific situations, the educator rates each student's self-regulatory behaviors on the following scale:

  - *Beginning*: Not yet able to demonstrate without scaffolding;
  - *Emerging*: Minimal or superficial demonstration, prompting likely required;
  - *Proficient*: Sufficient demonstration, including self-appraisal and detailed, personalized application;
  - *Advanced*: Independent and consistent demonstration, teaches/prompts others; or
  - *Not Observed*: Documented if there has not been the opportunity to observe the behavior performed by an individual student.

  Example observed behaviors include the following:
  - Demonstrates the ability to create a plan to accomplish a task or set of tasks.
  - Identifies potential barriers to plan completion using if–then statements.
  - Plans and practices ignoring some distractions during a task, resulting in increased focus.

  Summary reports are automatically generated on https://www.cccstudent.org/.
- The Self-Regulation Performance-Based Reflection (Gaumer Erickson & Noonan, 2022c), directly aligned with the Performance-Based Observation, promotes students' reflection on their demonstration of self-regulatory behaviors within authentic situations. This four-item rubric guides students to determine the quality of their planning, monitoring, adjusting, and reflecting related to a specific task or project. Triangulating students' ratings with the Performance-Based Observation results in a more comprehensive analysis of performance. The Self-Regulation Performance-Based Reflection can be used at purposeful intervals to monitor the development of each student. Using the rubric, students reflect on their self-regulation behaviors related to:
  - planning,
  - monitoring,
  - adjusting, and
  - reflecting.

The Self-Regulation Assessment Suite: Technical Report (Gaumer Erickson & Noonan, 2022a) includes further background on self-efficacy constructs, administration procedures, validity and reliability evidence, recommended uses of the results, and descriptions of the assessment items.

Instructional Practices:

- *Teaching Self-Regulation in Elementary Classrooms K–2* (Heger et al., 2022d) and *Teaching Self-Regulation in Elementary Classrooms 3–6* (Heger et al., 2022e) each outline more than 25 instructional activities across eight lessons:
  - Lesson 1: Defining Self-Regulation
  - Lesson 2: Understanding Your Ability to Self-Regulate
  - Lesson 3: Making a Plan
  - Lesson 4: Monitoring Your Plan
  - Lesson 5: Adjusting as Needed
  - Lesson 6: Reflecting on Your Plan
  - Lesson 7: Self-Regulation—Putting It All Together
  - Lesson 8: Implementing Your Plan

  The lessons include explicit instruction and application elements that teachers can modify based on students' experiences and needs. The lessons, accompanied by PDF student workbooks with worksheets that can be reproduced to facilitate learning, are available for purchase at https://www.cccframework.org/competency-lessons-and-student-workbooks/.
- *Teaching Self-Regulation: 75 Instructional Activities to Foster Independent, Proactive Students, Grades 6–12* (Gaumer Erickson & Noonan, 2022d) contains 75 instructional activities across seven chapters:

    - Chapter 1: Understanding Self-Regulation
    - Chapter 2: Making a Plan
    - Chapter 3: Monitoring Your Plan and Progress
    - Chapter 4: Adjusting Your Plan
    - Chapter 5: Reflecting on Your Efforts and Outcomes
    - Chapter 6: Putting It All Together
    - Chapter 7: Measuring Growth in Self-Regulation

  The book includes links to free reproducibles on Solution Tree Press's website.
- Teachers can help students develop self-regulatory skills by creating templates that support planning, monitoring, adjusting, and reflecting work completion or projects (Gaumer Erickson & Noonan, 2022d). The Self-Regulation Project Log, Academic Success Log, and Effort and Learning Scales can be tailored to any age.
- In a meta-analysis of 48 elementary self-regulation programs, Dignath et al. (2008) found that across grades 1–6, the most effective self-regulation training programs focused on metacognitive strategies (especially planning) combined with cognitive strategies (especially elaboration and problem solving), as well as feedback. Additionally, the researchers found higher effects on academic achievement and motivation when students applied the self-regulation process individually rather than through cooperative learning.
- Emotional self-regulation is the process of determining emotions or emotional triggers and then enacting strategies to control the emotional response (Gross & Feldman-Barrett, 2011). Aldao et al. (2010) identified several effective strategies that students can learn, such as reappraisals (i.e., generating positive interpretations of stressful situations), problem solving (i.e., consciously attempting to change the situation), and mindfulness (i.e., acceptance of emotions without judgement).
- Self-regulation can be taught using children's literature (Cooper, 2007). Books like Maurice Sendak's (1963) *Where the Wild Things Are* can promote psychosocial development by providing character examples that demonstrate the importance of self-regulation at a time when children are beginning to strive for autonomy, control, and independence.
- Providing children free-choice opportunities (where they are encouraged to choose, plan, and try to accomplish what they want to do or learn) during their younger years helps develop self-regulation (Goodwin & Miller, 2013).
- "Old-Fashioned Play Builds Serious Skill," an NPR story (Spiegel, 2008), discusses the ways that providing children opportunities for improvised play can help build their self-regulation skills. The article provides recommendations of activities from three researchers, including:
    - The game of Simon Says, which requires children to regulate themselves by thinking about each suggested action and deciding whether or not to take the action.
    - Joint storybook reading—books like *The Little Engine That Could* (Piper, 1930) and other children's stories often feature characters who model effective self-regulation.
    - Opportunities for children to engage in complex imaginative play—unstructured, creative play encourages the application of self-regulation.
    - Encouraging students to talk to themselves—the use of "private speech," where children talk to themselves about what they are doing, helps them develop self-regulation by applying self-talk in imaginary play as they are adjusting for things in their environment that are not provided (e.g., plastic props) or changing circumstances (e.g., new friend changing the rules).
- Teachers can incorporate activities to help students monitor their learning. For instance, researchers found that having students generate keywords when reading resulted in more

accurate judgment of learning and comprehension for sixth and seventh graders. Their comprehension was both self-rated and assessed via a test (de Bruin et al., 2011).

- The Self-Determined Learning Model of Instruction (SDLMI) teaches students to self-direct their own learning. While originally developed for adolescents, Wehmeyer and Palmer (2003) note that there are benefits of beginning the process of self-regulated learning in early grades. Students as young as 5 with and without disabilities were able to effectively use the SDLMI to set goals, take action, and adjust goals as they moved toward self-regulation. A free 48-page guide is available (Shogren et al., 2017). High school students with cognitive disabilities who received instruction with model over the course of 2 years "had significantly better academic and transitional goal attainment outcomes and had greater access to the general education curriculum" (Wehmeyer et al., 2012, p. 150).

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