Research Guide (Grades 7–12)
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 goal.
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:

- Self-regulation can predict academic achievement (Ursache et al., 2012).
- Training students in self-regulation has a positive effect on learning outcomes, strategy use, and **motivation** (Dignath et al., 2008).
- The frequency of students' self-regulated strategy use predicted a substantial amount of variance in achievement scores (Nota et al., 2004). Self-regulated learning strategies include self-evaluation, **goal setting** and planning, keeping records (like a diary) and monitoring, student-initiated practice via rehearsing and memorizing, seeking peer assistance, seeking teacher assistance, and reviewing notes.
- **Self-efficacy** (belief and confidence in abilities) is positively correlated to self-regulated learning, as are task value beliefs (beliefs that the work or task is interesting and valuable; Pintrich, 1999).
- Accomplishing goals requires effective planning and goal-oriented behaviors during goal striving (i.e., working toward the goal; Boekaerts & Corno, 2005; Duckworth et al., 2011). Research (Duckworth et al., 2011) conducted with 66 second-year high school students at an urban school showed that self-regulatory strategies for successful goal pursuit can be taught directly. These self-regulatory strategies consist of mental contrasting and implementation intentions, defined below.
    - Mental contrasting involves imagining a desired future (e.g., graduating high school, doing well on a test) and then reflecting on the present reality and any obstacles that might stand in the way (Oettingen & Gollwitzer, 2010). Then students imagine themselves overcoming these obstacles.
    - Implementation intentions specify when, where, and how the goal will be pursued (Oettingen & Gollwitzer, 2010). They can take the form of if–then plans that highlight what step the student will take in different situations to stay on track during goal striving. For example, in the study by Duckworth et al. (2011), students identified two positive outcomes of completing practice tests in a PSAT preparation workbook and two potential obstacles to completing the tests (mental contrasting). They then wrote potential solutions in the form of if–then statements to overcome the obstacles (implementation intentions). These students completed 60% more practice questions than students who did not use the mental contrasting/implementation intentions strategies.
- Self-regulation, combined with **curiosity** and **self-awareness**, accounts for individual differences in reading ability (Malanchini et al., 2019).
- While self-regulation is often studied as an individual process, research increasingly encompasses its relation to social context elements (Meyer & Turner, 2002).
    - In a qualitative study, researchers found that scaffolded instruction during a classroom math lesson provided the knowledge, skills, and support for developing students' self-regulation (Meyer & Turner, 2002).
    - Instructional scaffolding supports student self-regulation by helping students increase understanding and thereby building their confidence, engaging students in learning while also supporting socio-emotional needs, and helping students build and apply autonomy (Meyer & Turner, 2002).
- Yang & McGinley (2022) found that peer attachment was the most prominent contributor to adolescents' development of prosocial behaviors, with teachers and other nonparental adults being next prominent. Adolescents in close relationships have more opportunities to attune themselves to the emotions of those in each relationship, and they can be encouraged to recognize and manage their emotions, leading to better self-regulation; "quality attachment

relationships might compensate for less mature self-regulation facilitating the maturation of those regulatory abilities needed for prosocial practices" (p. 3).

- A recent meta-analysis (Theobald, 2021) found that learning self-regulation strategies increases students' academic achievement. "School children improved their [self-regulation] strategies and performance more if they were taught when, why, and how they should use certain … strategies" (p. 4). Trainings are also more effective if integrated in specific, content-related courses with teacher feedback, allowing students opportunities to see how self-regulation can be applied in and adapted to different contexts. With an increase in the ability to self-regulate, students in the meta-analysis "reported more intrinsic motivation and interest" in learning (p. 15), which increased their **self-efficacy** and course performance.

Assessments:

- The Self-Regulation Formative Questionnaire (Gaumer Erickson et al., 2018) is a self-report measure that asks students to respond to 28 items on a 5-point Likert-type scale from *Not Very Like Me* to *Very Like Me*. This questionnaire was designed for students in middle and high school. 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. This questionnaire 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). The following example items represent each of the four essential components:
    - I plan out projects that I want to complete. (Plan)
    - I keep track of how my projects are going. (Monitor)
    - As soon as I see things aren't going right, I want to do something about it. (Adjust)
    - I feel a sense of accomplishment when I get everything done on time. (Reflect)

  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 (Gaumer Erickson et al., 2019) 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 make progress toward reaching a goal, learning a skill, or accomplishing a task.
        b. When you follow your teacher's detailed directions (including making changes as suggested by your teacher and reflecting on your progress) for reaching a goal, learning a skill, or accomplishing a task.
        c. When you proactively use a process (e.g., planning, monitoring the plan, making changes as needed, and reflecting) to reach a goal, learn a skill, or accomplish a task.
        d. When you proactively plan for how to reach a goal, learn a skill, or accomplish a task.

  - True or false: Self-regulation is important for academics, but it doesn't really help improve athletic or musical ability.
  - Imagine that you are struggling to learn a concept in math. Provide brief descriptions of how you would address the first two components of self-regulation to work towards improving your learning.
    - Plan:
    - Monitor:

  The knowledge test is directly aligned with *Teaching Self-Regulation in Middle and High School Classrooms* (Gaumer Erickson et al., 2020; 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, and 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 complete 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 Middle and High School Classrooms* (Gaumer Erickson et al., 2020) outlines 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 a PDF student workbook 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.
- Rubrics are self-assessment tools that have positive effects on self-assessment. When used in conjunction with scripts, they have been found to facilitate self-regulation and learning (Panadero et al., 2012).
    - Rubrics consist of a list of criteria for assessing the important goals of a task, a grading scale for the different levels of achievement, and a description of those levels (Panadero et al., 2012).
    - Scripts are a second type of self-assessment tool. They consist of specific questions about how to approach a task from beginning to end and are organized into steps. The questions are based on models of how an expert would complete the task (Panadero et al., 2012).
- Reducing or imposing cognitive load is caused not only by curriculum design and teachers but also by students' motivation, resources, and investment (Seufert, 2020). One way to improve students' monitoring accuracy is to give them this algorithm: "Learners are asked to take into

account their actual performance and their mental effort for the current task. … If task performance was high with low effort, they should choose a more difficult task," but "if performance was low with high effort, they should choose a less difficult task" (p. 1154). This algorithm also improves learning outcomes. Additionally, to stimulate self-regulation on the meta-level, educators can provide hints to students that information in the instructions for a task is not perfect, thus encouraging student to compensate.

- One aspect of self-regulated learning is that the student can monitor whether learning has occurred. 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).
- A self-regulated strategy development approach has been used to teach writing to children with ASD (Asaro-Saddler & Bak, 2014).
    - Using a peer component together with the mnemonics POW (Pick ideas, Organize notes, Write and say more) and TREE (Topic sentence, Reasons, Explain, strong Ending) proved effective in improving persuasive essays for children with ASD in the study.
- Self-regulation training helped second-year middle school students write longer stories that included more genre-specific elements, as measured against a control group (Zaien, 2021). Self-regulation training included teaching students to do the following:
    - plan by remembering the mnemonic POW;
    - self-monitor by graphing their progress;
    - collaborate with each other to generate coping statements;
    - transfer the above skills to other kinds of writing besides story writing.
- For children with ADHD, using interventions that feature if–then statements with goal setting followed by a support plan was shown to increase self-regulatory competencies (Guderjahn et al., 2013). For example, "If I get distracted while completing my homework, then I will take three deep breaths and return my focus to my work."

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