

Chapter 2

Self-regulated Learning and Development in Teacher Preparation Training

Students are self-regulated to the degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process. These students self-generate thoughts, feelings, and actions to attain their learning goals.

Zimmerman (2001, p. 5).

Abstract Social cognitive theory emphasizes the importance of human agency and provides a framework to study how learners acquire competencies, skills, dispositions, beliefs, and self-regulation. This chapter argues that self-regulated learning and development is one way in which social cognitive theory has been applied to preparing future teachers. In addition, self-efficacy, individuals' belief about their capability to perform a specific task, has been associated with academic achievement among teacher candidates. Specifically, the cyclical phases of self-regulation described here provide a framework to train teacher candidates to become proactive and goal directed learners and practitioners. Learning to teach is not enough for today's teacher candidates, therefore, integration of crucial self-regulatory learning strategies into their curricula is recommended by researchers to put future teachers in charge of their learning processes. In general, this chapter reviews the existing literature on self-regulation of learning and motivation, and among teacher candidates who struggle with personal and academic challenges specifically.

Keywords Self-regulation • Teacher candidates • Motivation • Social cognitive theory • Self-regulation theory • Self-efficacy • Learning skills

Since Bandura's (1977) introduction of social cognitive theory explaining how learners acquire competencies, skills, dispositions, beliefs, and self-regulation, educators and researchers have increasingly applied his theory to different aspects of learning and development (Bembenutty et al. 2013; Boekaerts et al. 2000; Corno 1993; Winne 1997; Zimmerman and Schunk 2011). *Self-regulation*

of learning refers to students' self-generated thoughts, feelings, and actions that are systematically designed to affect learning of knowledge and skills (Zimmerman 2000). Zimmerman construes self-regulated learners as individuals who are cognitively, motivationally, and behaviorally active participants in their own learning process. During the last few decades, self-regulation of learning has acquired a pivotal role in all areas of learning including sport and academic learning; medical and music fields; and mathematics, sciences, and technological disciplines (Acevedo et al. 2007; Bembenutty et al. 2013). There is a global interest in self-regulation theory with the most notable research and interventions in self-regulation being conducted in Africa, South and North America, Europe, Australia, and Asian countries (Bembenutty et al. 2013; Vohs and Baumeister 2011).

Four models of self-regulated learning emerge from amongst those that have been most commonly employed in educational research and instruction. Winne, Boekaerts, Pintrich, and Zimmerman share the investigation of five underlying issues: (1) What motivates students to self-regulate during learning? (2) What processes or procedures engages students in becoming self-aware of self-reactive? (3) What are the key processes and responses that self-regulated students use to reach academic goals? (4) How is student's self-regulated learning affected by the social and physical environment? (5) How is the capacity to self-regulate when learning acquired by the learner? (Zimmerman and Schunk 2011). The case study focuses on Zimmerman's model because it has been applied extensively in developmental research emphasizing the importance of social relationships in learning.

Winne's inclusion of the recursive feedback loop in his information processing model of self-regulated learning (Winne and Perry 2000) provides learners with distinctive forms of cues, feedback, and supplementary information as they learn new instructional material in accordance with their phase of self-regulated learning (Zimmerman and Schunk 2011). This model focuses on the learner's metacognition, defined as awareness of one's own strength and abilities in relation to the task demands, and specific ways in which learners cognitively adapt to the task demands to regulate their learning strategies.

Boekaerts' model of self-regulated learning looks at learning episodes, in which learners are asked to demonstrate context-specific, goal-directed learning behavior (Boekaerts and Niemivirta 2000). An important point of this model is that learners are encouraged to co-create learning episodes that will help them to reach their own goals—as opposed to participating in episodes created exclusively by the teacher. Self-regulation involves being able to adapt to various learning episodes, including those set by the teacher.

Pintrich's model suggests that self-regulated learning occurs in four phases with processes falling into cognitive, motivational/affective, behavioral, and contextual areas (Pintrich 2000). The first phase is forethought, planning, and activation. The second phase is the monitoring phase during which learners are engaging in metacognitive awareness and monitoring of various processes (e.g., cognition, motivation, and affect), of the effort and time needed to complete the task,

and of the changing task and contextual conditions. In the third phase of control, learners select and adapt cognitive strategies for learning and thinking. They manage motivation and affect, increase or decrease effort, seek help, change or negotiate the task, and change or leave the learning context. In the final phase, learners are believed to react and reflect by forming cognitive judgments and attributions, choosing behavior, and evaluating the task and learning context.

Research on self-regulation has revealed that in practically all levels of learning enterprises, when learners engage in self-regulatory processes such as goal-setting, self-monitoring, self-evaluation, and self-reflection, students achieve high levels of personal, academic, and professional outcomes in diverse contexts and social domains. For instance, in the medical field, studies have found the ability of the patient to control the illness through an effective therapeutic plan is significantly influenced by social and behavioral factors (Clark 2013; Clark and Zimmerman 2014). Similarly, physical education students who are successful learners engage in self-observation, emulation and self-control, self-regulating their behavior, and controlling their actions during practice sessions. Over the last 40 years, scholars have introduced numerous theories of self-regulation (Boekaerts 1997; Pintrich 1999; Winne 1996, 2001; Zimmerman 2000).

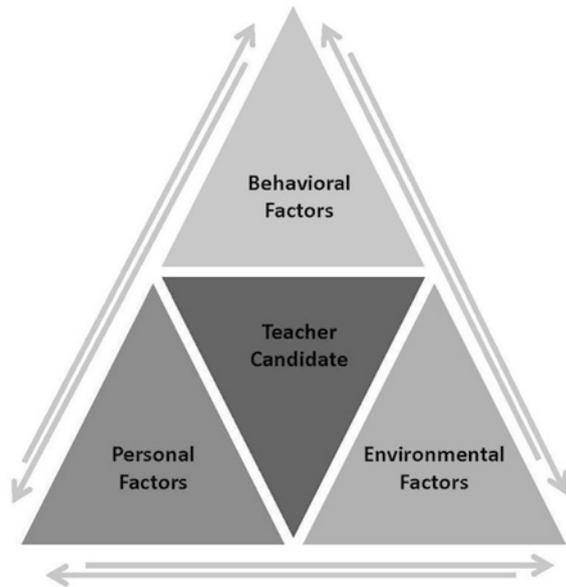
Based on Bandura's social cognitive theory, Zimmerman's (2000) comprehensive theory of self-regulation has generated numerous applications to sports, music, medicine, and learning disciplines, and has been tested and replicated over time. Foundational to any discussion of Zimmerman's theory is a thorough introduction of Bandura's social cognitive theory. The following section includes an overview of social cognitive theory and self-efficacy beliefs, specifically teacher-self efficacy.

2.1 Bandura's Social Cognitive Theory

Bandura introduced social cognitive theory as a reaction to previous theories that emphasized that individuals are subjected to environmental influences, which reduces their behaviors to stimulus control through reinforcement and punishment. Bandura emphasized that individuals learn within a social context through interactions with their environment and by observational learning. He proposed a triadic approach of reciprocity in which the individuals influence the environment and the environment influences the individuals and the behaviors. In turn, behaviors influence both the individuals and the environments. Triadic reciprocity (see Fig. 2.1) represents human functioning as involving complex reciprocal interactions under the control of the individual.

Social cognitive theory considers individuals to be agents of change who develop and adapt with the intention to influence their own functioning and goals while maintaining control over their outcomes and environment.

Fig. 2.1 Triadic reciprocity in social cognitive theory



Social cognitive theory considers individuals to be agents of change who develop and adapt with the intention to influence their own functioning and goals while maintaining control over their outcomes and environment. Bandura construes individuals as able to engage in self-organization, proactive learning, self-regulation, and self-reflection (Bandura 1997). Social cognitive theory is founded upon four core properties of human agency: intentionality, forethought, self-reactiveness, and self-reflectiveness (see Table 2.1).

- *Intentionality* involves proactivity and specific planning measures for how one will pursue goals. For example, how willing is a college student to set aside 2 h to complete a homework assignment rather than going out to a party with his friends?
- *Forethought* involves goal setting while considering outcomes. An example of the forethought core property is when a student independently turns off his cell-phone in order to avoid a distracting call since he knows that chatting with his friend will preclude him from completing the homework within the time frame of his homework schedule.
- *Self-reactiveness* involves self-monitoring one's goals and maintaining control over the plans to attain those goals. In the case of the homework, the student periodically evaluates the quality of the homework while he is working on the task in light of the standards and rubrics provided by the instructor.
- *Self-reflectiveness* involves self-examination of outcomes, thoughts, actions, feelings, behavior, and personal efficacy. For instance, a student would be careful to pay close attention to his evaluations and reactions to the complete

Table 2.1 Social cognitive theory’s core properties of human agency

Core of human agency	Description	Role of teacher educators	Role of teacher candidates
Intentionality	Forming intentions that include actions, plans, and strategies for realizing them	Instruct and model how intentions influence the outcome of specific assignments	Include the use of study logs to state intended outcomes and track how those outcomes are realized
Forethought	Setting goals and anticipating likely outcomes of prospective actions to guide and motivate efforts	Emphasize the significant role of goal setting and goal properties and their influence in setting up a sequence of actions that lead to successful task completion	Set goals by including properties that sequence the actions that will lead to successful task completion
Self-reactiveness	Adopting personal standards, monitoring, and regulating actions by self-reactive influence and by doing tasks that result in self-satisfaction and self-worth	Give students examples of tasks with self-administered consequences that can enhance motivation	Set standards for proximal sub-goals and monitor them while increasing self-efficacy beliefs
Self-reflectiveness	Self-reflecting on the level of self-efficacy, thoughts, and actions, and by making adjustments if necessary	Model adjustments to own teaching and strategies to increase students’ familiarity with how easily adjustments can be made when necessary	Examine the degree of self-satisfaction with the completed task and incorporate feedback when planning improvements for how a similar task can be completed with some adjustments

homework task. Based on the outcomes, the student considers his options to improve his performance. He can invite input from a knowledgeable peer or his teacher for feedback about the quality of the homework rather than solely rely on his self-reflections.

Consistent with Bandura’s four core properties of human agency, skilled learners are those who independently activate cognition, affect, and behavior in order to pursue goals and reflect on outcomes. They are agents of social change who influence their environments rather than become subject to environmental influences, reinforcement, and punishment. In addition, they exercise control of situations that impact their learning experiences with their competencies, self-beliefs, and outcome expectancies. Their self-beliefs help them in becoming proactive human agents who act intentionally and are academically successful. These four core properties are intentionally designed to influence students’ increased self-beliefs in their skills and competencies to complete challenging tasks, their self-efficacy.

Of all the components of social cognitive theory, one of Bandura's greatest contributions was the importance of self-efficacy beliefs for academic success as the cornerstone of all human agencies (Bandura 1977).

2.2 Self-efficacy for Learning

Self-efficacy refers to individuals' beliefs about their capability to perform designated tasks (Bandura 1997; Usher and Pajares 2008). According to Bandura, individuals' self-perceptions of capability are instrumental to successful goal attainment and to the control of the process and outcomes of reaching those goals. Exercising environmental control and managing social interactions depend on the level of self-belief in one's capabilities. For instance, a learner who does not believe that he can master an important homework task would have difficulty completing the task successfully because levels of self-efficacy influence the degree of effort one will give for a specific task. A learner with low self-efficacy would easily become distracted and readily divert his attention from completing the task. A learner with high self-efficacy will delay gratification, remaining focused on the task to complete the assignment successfully.

Bandura believed a high degree of self-efficacy is necessary to engage in self-control of behaviors, actions, and thoughts or self-regulated learning. Proactive and self-regulated learners have high levels of self-efficacy that help them to sustain motivation when tasks become difficult. However, learners' who have low levels of self-efficacy beliefs would not be capable of putting sufficient effort into highly demanding tasks. Self-efficacy influences choice, effort, perseverance, resiliency, stress and anxiety. In order to be a self-regulated learner, an appropriate level of self-efficacy is required.

Further investigation into self-efficacy delineates three dimensions: magnitude, strength, and generality (Pajares 1996). *Magnitude* involves the level of task difficulty. For instance, a student who judges a trigonometry homework assignment as highly challenging has assessed the magnitude of the assignments difficulty. *Strength* involves the degree of self-efficacy for a designated task. For example, a student may vary in degrees of self-efficacy for specific tasks. He might have a higher degree of self-efficacy for algebra homework than for trigonometry based on his past experiences with each subject. *Generality* involves the degree to which the capability to engage a task can be extended into a different content or a different situation. To illustrate, if a student's self-beliefs are not generalized to mathematics, he may believe that he can complete the algebra task successfully but not the trigonometry assignment (see Table 2.2).

The association between self-efficacy and academic achievement is supported by research investigating self-efficacy of learning among college students. Under the umbrella of the social cognitive theory of self-regulation of learning, Bembenuddy and White (2013) examined the association between homework practices of college students, self-efficacy, self-regulation of learning, and final

Table 2.2 Dimensions of self-efficacy

Dimensions	Descriptions	Examples
Magnitude	Difficulty level (e.g. easy, moderate, difficult) that an individual believes is required to perform a certain task	Teacher candidates have different levels of self-efficacy to write and carry out a lesson plan for a specific setting. The lowest level of confidence can lead to poor performance. When teacher candidates assesses the level of difficulty and ask for help from their cooperating teacher or advisor, their self-efficacy for delivering the lesson increases and their performance is evidence of their beliefs in their abilities to carry out their plan successfully
Strength	Amount of conviction an individual has about performing successfully at diverse levels of difficulty, level of confidence to excel at specific tasks	Teacher candidates ask themselves how confident they are that they will be able to carry out the lesson plan in a diverse setting so that all students have the opportunity to learn. Rating one’s level of confidence before and after delivering a lesson plan can increase self-efficacy in teacher candidates’ confidence when the learning outcomes are successful. If the teachers’ self-efficacy decreases, attribution can be made to specific moments when the teacher candidate became unsure of the planned lesson or ability to carry out the plan effectively
Generality	Degree to which the expectation of successful task completion is generalized across situations, students can perceive themselves as self-efficacious in a range of activities or within one domain of functioning	Most teacher candidates choose to teach lessons in areas where self-efficacy is high, and are less likely to choose areas in which they have lower self-efficacy. Knowing strengths and weaknesses when assessing areas of concentration or expertise is important to future teaching and learning experiences. Attributing a weak delivery of a lesson plan in mathematics to one’s lack of content knowledge can encourage the teacher candidates to take additional math classes or work with a tutor

course grades. The results indicated that students with high self-efficacy beliefs were those who also reported intrinsic motivation and engaging in help seeking. Recordings in their individual homework logs suggested that the relationship between students’ beliefs and homework practices were associated with their academic performance, adaptive help seeking, and self-efficacy beliefs. More specifically, White and Bembenutty (2013) examined teacher candidate’s use of help-seeking strategies and self-efficacy beliefs for preparing to pass a state certification examination. They found that self-efficacy was positively related to teacher

candidates' help-seeking strategies, adaptive self-regulatory strategies, and willingness to delay gratification. Educators and aspiring educators also need to have teachers' self-efficacy.

2.3 Teacher's Self-efficacy Beliefs

Enhancing teachers' self-efficacy beliefs of teacher candidates is critical to their performance as teachers and student learning. *Teachers' self-efficacy* refers to teachers' "beliefs in their ability to have a positive effect on student learning" (Ashton 1985, p. 142). According to Tschannen-Moran and Hoy (2001) teachers' self-efficacy beliefs influence teachers' attitudes towards helping their students, their level of satisfaction, and their desire to motivate their students. Teachers' efficacy beliefs guide teacher candidate's professional development during their teacher education preparation programs and after completion of their initial teaching certification (Tschannen-Moran and Hoy 2001).

Bembenutty (2006) investigated the link between teachers' self-efficacy beliefs and academic performance and found support for the association between self-efficacy beliefs and use of self-regulatory learning strategies. Furthermore, Bembenutty and Chen (2005), examined teachers effectiveness and self-efficacy and found additional support for these associations between teachers' beliefs and self-regulatory skills. In a consistent vein, White and Bembenutty (2013) found that self-efficacy is essential to teachers' successful academic performance. Their results revealed that students' tendencies for help seeking vary according to their teachers' self-efficacy beliefs and use of self-regulatory strategies such as delay of gratification.

2.4 Self-regulation of Learning

Bandura (1977) introduced the concept of self-regulation as part of human agency and exercise of control. To Bandura, self-regulation encompassed an essential component of humanness with self-control of individuals over their situations, environments, and contexts. Individuals are not subjected to stimulus control; rather they exercise cognitive, emotional, and behavioral power over their surroundings. Human thought, affect, and behavior are influenced by the ways in which events are construed and depend upon beliefs. Bandura posited that individuals are not just reactors to external stimuli, but that they exercise influence over their environment and own behavior (Bandura 1977). Zimmerman (2000) has successfully applied the concept of self-regulation to academic contexts.

According to Zimmerman (2000), self-regulation of learning is a fundamental element for all academic enterprise and success. Self-regulated learners engage in actions, thoughts, and behaviors in order to pursue determined tasks. They do so

by identifying goals and strategies and by monitoring and evaluating them. Over the past decades, scholars and educators have consistently demonstrated the efficacy of self-regulation on enhancing learning and sustaining goals over significant periods. Self-regulation involves motivation, cognition, and resource management (Pintrich and De Groot 1990; Pintrich et al. 1993).

2.5 Cyclical Phases of Self-regulation

Zimmerman conceptualized self-regulation as a cyclical process with three phases: forethought, performance, and self-reflection. The phases are cyclical because each process within each phase of self-regulation influences the next one. For instance, after students have engaged in self-reflection, they continue the cycle in forethought with a new task or a revision of the previous one. Given the level of performance, the students adjust and adapt their actions, behavior, and beliefs while tackling a new, similar, task. As Kitsantas and Dabbagh (2010) observed, “The cycle of learning promotes individual empowerment, in part because it reinforces the beliefs of the individual in his or her ability to effectively control aspects of the learning experience toward a desired outcome” (p. 11). In a similar vein, Zimmerman (2000) describes the structure of self-regulatory systems in these terms:

From a social cognitive perspective, self-regulatory processes and accompanying beliefs fall into three cyclical phases: forethought, performance or volitional control, and self-reflection phases. Forethought refers to influential processes that precede efforts to act and set the stage for it. Performance or volitional control involves processes that occur during motoric efforts and affect attention and action. Self-reflection involves processes that occur after performance efforts and influence a person’s response to that experience. These self-reflections, in turn, influence forethought regarding subsequent motoric efforts—thus completing a self-regulatory cycle. (p. 16)

The three phases of self-regulation are (see Fig. 2.2):

- The *forethought phase*: learners are proactive agents who set short and long-term goals, identify strategies to pursue those goals, and assess their self-efficacy beliefs and intrinsic interest on those tasks as well as their goal orientation.
- The *performance phase*: learners engage in self-monitoring and self-control of those goals, strategies, and motivation while seeking help from knowledgeable individuals and delay gratification when it is necessary for the sake of completing goals.
- The *self-reflection phase*: learners engage in self-evaluation of tasks completed, examine their level of self-satisfaction and adapt to their circumstances by determining whether tasks need to be repeated and whether the cycle will move on to a new task if the previous one is considered at a satisfactory level (see Table 2.3).

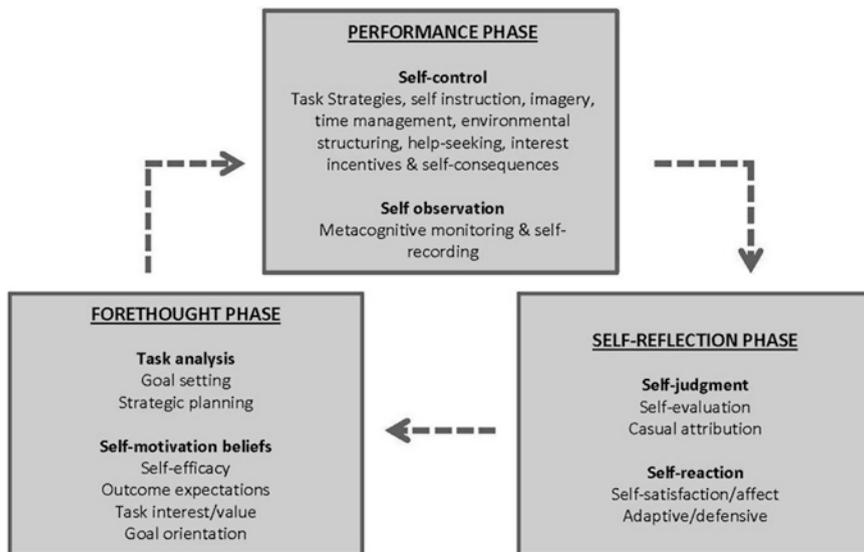


Fig. 2.2 Phases of self-regulated learning

Table 2.3 displays the applications of the cyclical phases of self-regulation, its subprocesses and descriptions, and examples highlighting teacher educators’ responsibilities and teacher candidates’ tasks. To illustrate, during the forethought phase, a highlighted subprocess is goal setting. The responsibility of teacher educators is to demonstrate goal setting as a critical segment of teaching and learning while the teacher candidates set goals that are suitable to the tasks. In this phase, strategic planning is another subprocess of self-regulation. The responsibility of teacher educators is to require early action planning to be task-specific and reflected in a daily planner while the teacher candidates record action plans in a weekly planner to set up tasks strategically by giving adequate time to carry out the plan.

During the performance phase, self-monitoring is a highlighted subprocess. During this subprocess, teacher educators remind teacher candidates to evaluate their self-efficacy by examining their strengths and weaknesses for a specific task performance. Concurrently, teacher candidates monitor their self-efficacy for doing the tasks by tracing the effectiveness of the chosen strategy. In this phase, help seeking is another subprocess of self-regulation. The responsibility of teacher educators is to remove the negative stigma from asking for help by identifying and defining strategic help seeking behaviors while the teacher candidates proactively seek help from appropriate resources.

During the self-reflection phase, self-evaluation is a subprocess in which the teacher educators provide clear criteria for teacher candidates to compare their work to the standard while teacher candidates use criteria and goal-related

Table 2.3 Cyclical phases of self-regulation and applications to teacher candidates

Cyclical phases of self-regulation	Subprocesses of self-regulation	Description of the subprocesses of self-regulation	Teacher educator’s responsibilities to enhance acquisition of the self-regulatory skills	Teacher candidate’s tasks to acquire self-regulatory skills
Forethought	Goal Setting	Setting specific high quality proximal goals	Demonstrate goal setting as a critical segment of teaching and learning	Set proximal goals that are suitable to the task
	Strategic Planning	Choosing a specific strategy to meet the demands of the task	Require early planning to be task specific and reflected in a daily planner	Record plan in daily planner to set up tasks strategically giving adequate time to carry out the plan
	Self-efficacy	Individual beliefs in one’s capability to learn a specific task	Provide opportunities for goal attainment that lead to increased motivation and higher levels of self-efficacy	Set goals for specific tasks that enhance self-efficacy
	Goal Orientation	Learning or mastery of goal orientation	Provide challenging tasks that enhance students’ abilities	Set up self-reminders of course goals for times when a low grade might discourage motivation
	Outcome Expectancy	Anticipated consequences of actions	Link outcome expectancy to goals by modeling self-set goals and personal outcome expectations	When setting a goal link a predicted outcome expectation for that goal
	Intrinsic Interest	Interest in task generated from self-motivation while working on task	Encourage thinking and discussion on how different classes are approached to ascertain interests and motivation	Begin goals with “I enjoy to” to encourage interest in the task
Performance	Attention Focusing	Remain focused on performance, not easily distracted	Demonstrate strategies for capturing attention when bored	Make check marks on a notepad when daydreaming to focus attention on tasks
	Self-instruction	Uses imagery and self-verbalizations to control performance	Model self-instruction by using self-talk to work through problem solving	Use specific self-talk phrases to move through a learning task

(continued)

Table 2.3 (continued)

Cyclical phases of self-regulation	Subprocesses of self-regulation	Description of the subprocesses of self-regulation	Teacher educator's responsibilities to enhance acquisition of the self-regulatory skills	Teacher candidate's tasks to acquire self-regulatory skills
	Self-monitoring	Knowing when one is performing well and when one is not	Remind students to keep track of their self-efficacy to manage their strengths and weaknesses for a specific task performance	Monitor self-efficacy for doing the task tracing the effectiveness of chosen strategy
	Delay of Gratification	Postponing a pleasurable activity (party) until after homework or studying for a test	Frequently remind students how to manage distractions that come from social sources and not allow them to interfere with completing a task	Set priorities that list task completion before social activities and rewards for completing a task on time
	Time Management	Planning tasks using time frames and by predicting and monitoring time allotment	Use time management tools in teaching and learning segments helping students to raise awareness of how much time it takes to complete a specific task	Manage time by prioritizing tasks and systematically scheduling time for each task to be completed in a specific time frame
	Self-consequences	Setting up rewards for completing work on time	Arrange assigned tasks to include a reward system for when work is completed within the set time frame	Use self-rewards to increase motivation when a challenging task becomes too difficult to complete
	Environmental Control	Managing distractions by turning off cell phone or computer access	Give students choices regarding <i>where</i> they work and <i>with whom</i> they work best	Assess environmental conditions when working on a task and make the decision to change <i>where</i> the task can best be completed successfully
	Help Seeking	Asking for a hint or response from a peer or teacher to move forward with a task	Remove the negative stigma from asking for help by identifying and defining strategic help seeking behaviors	Be proactive and seek help from appropriate resources

(continued)

Table 2.3 (continued)

Cyclical phases of self-regulation	Subprocesses of self-regulation	Description of the subprocesses of self-regulation	Teacher educator’s responsibilities to enhance acquisition of the self-regulatory skills	Teacher candidate’s tasks to acquire self-regulatory skills
Self-reflection	Self-evaluation	Seek out opportunities to reflect and evaluate performance	Provide clear criteria for students to compare their work to the standard	Use criteria and goal related comparisons to evaluate performance
	Attributions	Find a connection between performance to strategy use rather than low ability	Focus students on their efforts rather than task conditions when providing feedback for work that has been completed successfully or unsuccessfully	Look for strengths and weaknesses to attribute successful and unsuccessful task completion
	Self-reactions	Look for the more effective methods of completing the task than those used	Provide models of completed tasks delineating the strategies that led to successful task completion	Remain open to attempting new methods of doing specific types of tasks even though others might be more familiar and less challenging
	Self-satisfaction	Evaluate how well the task was completed and if the standard was met	Establish optimum learning by establishing goals and actions plans with students that provide criteria for checking how well their work met the standard	Use feedback from the teacher to assess how well one’s own work compares with the standard for the task
	Adaptivity	Use feedback from the self-reflection phase to strengthen or preserve fore-thought beliefs	Assist students when using feedback and self-evaluations to make decisions about how to plan and complete similar assignments in the future successfully	Incorporate feedback and self-evaluations when beginning a task similar to the one completed

comparisons to evaluate performance. In this phase, self-satisfaction is another subprocess of self-regulation in which the responsibility of teacher educators is to provide criteria for checking how well students’ work met the standard while the teacher candidates use feedback from the teacher to assess how well one’s own work compares with the standard for the task.

Table 2.4 Developmental levels of self-regulation

Developmental levels of self-regulation	Role of the teacher educator	Role of the teacher candidate
Observation	Demonstrate self-evaluation strategies used to identify strengths and weaknesses	Attend to how the model uses self-evaluation strategies to identify strength and weaknesses
Emulation	Encourage students to discuss critical components of self-evaluation	Describe and demonstrate the use of self-evaluation strategies
Self-control	Provide assistance and feedback while monitoring student's use of self-evaluation strategies	Practice using self-evaluation strategies
Self-regulation	Encourage use of self-evaluation for tasks assigned to be completed independently	Consistently use self-evaluation strategies to assist independent self-evaluation

2.6 Why Is the Cyclical Process of Self-regulation Important for Teacher Candidates?

Teacher candidates need to learn how to be self-regulated. As Dembo (2001) has observed, learning to teach is not enough; teachers need to learn how to learn. Similarly, Randi (2004) argued that teacher preparation programs should consider integrating acquisition of crucial self-regulatory learning strategies into their curricula. During childhood and adolescence, students are guided by parents and teachers, but in post-secondary education, learners need to be self-directed, proactive, and in charge of their learning process. This approach is more salient for teacher candidates who need to foster self-assessment, self-reflection, and self-directed learning among their future students.

2.7 Research Evidence of the Applications of the Cyclical Phases of Self-regulation to Teacher Candidates

White and Bembenuddy (2013) conducted a study to examine teacher candidates' help-seeking tendencies while preparing to take a teacher certification exam, the LAST (Liberal Arts and Sciences Test). Two complementary theoretical models guided the study: achievement goal theory and self-regulation theory. Specifically, they assessed the different help-seeking orientations of teacher candidates, in particular, teacher candidates' use of avoidance, adaptive, and non-adaptive help-seeking strategies in order to master the content of a state certification exam. Participants in the study were teacher candidates drawn from a small private urban college.

The results revealed that students' tendencies for help seeking vary according to their goal tendencies, teacher self-efficacy beliefs, and use of self-regulatory strategies, such as delay of gratification. These findings suggest that teacher candidates

used help seeking as a self-regulatory learning strategy while pursuing academic goals. They also found correlations between LAST scores, teacher self-efficacy beliefs, self-efficacy for learning, and delay of gratification, self-regulation, intrinsic motivation, and help seeking. White and Bembenuddy argued that the results of their study were consistent with the self-regulatory approach of help seeking. They also reported that in their study, self-efficacy had a direct association with academic performance and help seeking.

White (2011) examined the help-seeking behaviors of teacher candidates who are at risk for failure of state certification examinations through use of a scale adapted to the arena of teacher education, the Preservice Teacher Help Seeking Scales (PTHSS). In the past, self-report measures of help-seeking behavior patterns have been problematic due to scales with limited reliability, which were not designed to be used in teacher education.

The study was conducted under the umbrella of help seeking as a self-regulatory strategy. White (2011) argued that specifically for aspiring teachers help seeking has not always been construed as a proactive, social behavior helpful to learning and that rather, help seeking has often been viewed as a sign of dependence, and as a result, many learners avoid seeking help. Consistent with Nelson-Le Gall (1981), White distinguished instrumental help seeking and executive help seeking. Instrumental help seeking is when learners seek help in order to master and learn tasks (also labeled adaptive help seeking) and executive help seeking happens when learners seek help for someone to do the task for them (also labeled non-adaptive help seeking). Participants in the study were 50 teacher candidates enrolled in a private college. Help seeking was assessed by:

- *Instrumental help seeking* measured instrumental (adaptive) help seeking from an instructor (5-items, a Likert scale).
- *Executive help seeking* measured executive (non-strategic help seeking) help seeking from an instructor (5-items, a Likert scale).
- *Help seeking avoidance* measured help avoidance (9-items, a Likert scale)
- *Help seeking benefits* assessed teacher candidates' perception about how beneficial help seeking is for them (7-items, a Likert scale).

The results revealed that teacher candidates who reported strategic help-seeking skills were more likely to learn how to pass the certification exams than teacher candidates with nonstrategic help seeking skills. White concluded that training teacher candidates on how to seek help enhances their use of help seeking as a self-regulatory strategy which in turn will result in passing state certification exams.

2.8 Developmental Levels of Self-regulation

Self-regulation is a social enterprise that involves a learner and a knowledgeable individual who can guide the learner through the process of acquiring self-regulatory skills. Consistent with Bandura (1997), modeling involves four

processes: attention, retention, practice, and motivation/reinforcement. According to Zimmerman, learners start the self-regulatory process by observing a skilled model. In the case of teacher candidates, the development of self-regulation requires an active learner sensitive to the social cues:

- Attention: Modeling will not occur unless observers are attentive to relevant environmental events.
- Retention: Observers use their cognitive skills and resources to process and retain observed patterns in their short and long-term memory.
- Production: Observers translate their mental conceptions of modeled events into actual behaviors, such as when they translate their thoughts into written sentences and paragraphs.
- Motivation: Observational learning requires certain influences because when students believe that models possess a useful skill they are likely to attend to such models and attempt to retain what they learn (Schunk and Zimmerman 2007).

Observation of competent models also motivates teacher candidates to shift from observing to emulating their actions, and then gradually gain self-control until the point of reaching the independent level of self-regulation. In Zimmerman's description of the development of self-regulation, both the teacher (model) and the learner have tasks and responsibilities. The four levels of development are: observation, emulation, self-control, and self-regulation (see Table 2.4).

- *Observation* involves the learners' ability to perceive and retain the patterns of the behavior demonstrated by the teacher. The teacher models by thinking aloud, explaining the processes, and demonstrating and verbalizing concepts and processes. At this initial level, learners actively attend to the skills, strategies, methods, and processes displayed by the teacher.
- *Emulation* involves the learners' efforts to reproduce the patterns of behavior observed under the direct tutelage of the teacher. The teacher guides the learners while they attend to reproduce the observed behavior under direct supervision of the teacher who provides feedback. At this level, learners actively engage in imitation and simulation of the skills, strategies, methods, and processes displayed by the teacher.
- *Self-control* involves the learners' attempts to produce the observed behavior under minimal guidance from the teacher. The teacher remains available to provide feedback when it is needed with limited supervision while the students attempt to reproduce the behavior. At this level, learners actively employ skills to reproduce the observed behaviors according to their own competency and skills.
- *Self-regulation* involves the learners' attempt to reproduce the observed behaviors independently. Under similar situations and conditions and with teacher assistance only when it is absolutely necessary, the learner applies the newly acquired strategy. The teacher remains available to provide feedback when it is absolutely required or requested. They challenge their students to continue

adapting and transferring the newly learned skills to different settings and conditions. At this level, learners self-regulate their behavior, skills, and motivation in order to produce the observed behavior in different conditions and based on their own adaptation and competence.

The phases of self-regulatory development are important to teacher training as a foundational approach for teaching children and adolescents (Randi 2004; Randi et al. 2011). Successful teachers routinely think aloud and verbalize their actions as they demonstrate a strategic approach to problem solving making sure their students are attentive to each and every action. They remain present and attentive to students who attempt to emulate what they have observed providing assistance as needed to move the student towards task completion. As students move into the self-control level and begin to take charge of planning their actions, teachers remain present to assist with task analysis and goal setting. At the self-regulation level, successful teachers support students as they attempt to apply learned behaviors to complete assigned tasks. They assist students to adapt their use of new strategies into new contexts based on their personal characteristics and self-efficacy beliefs.

Teacher candidates need self-regulated teacher educators (Dembo 2001). Caring teacher educators who focus on immediate and long-term goals, sustain a high level of self-efficacy, and have strong outcome expectancies provide students with vicarious learning experiences from good modeling. Their willingness to delay gratification and self-discipline while training teacher candidates is evidenced by their behaviors regarding their work and how frequently they provide feedback to their students. Teacher educators can be both role models and agents of transformation by demonstrating how they exercise influence over their own behavior, cognition, and environment. Although these patterns of behavior from teacher educators are important for all teacher candidates, it is essential for the development of self-regulation of teacher candidates who have experienced setbacks due to inadequate preparation as a result of attending schools in low socioeconomic settings, language barriers, and personal and family challenges (Randi 2004; Zimmerman 2002).

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2.9 Research Evidence of the Developmental Phases of Self-regulation

Research studies have continually supported the developmental levels of self-regulation. Zimmerman and Kitsantas (2002) had college students observe a mastery or a coping model displaying writing revision skills and engage in emulation; the

control group did not observe a model. Students who observed and emulated the coping model obtained higher self-regulatory writing skills than the other two groups. Zimmerman and Kitsantas (1997) trained high school students in dart throwing. After observing and emulating a model, students engaged in self-control and self-regulation. Shifting from a process to a product goal resulted in higher self-regulation and self-efficacy. McCaslin's (2001) approach of self-regulation focuses on empowering the individual through the development of an individual identity within the learning environment through a shift the burden of individual pursuit of goals to a shared responsibility. When faced with challenging tasks, interpersonal relationships can often impact success or failure. As students coordinate the multiple social worlds they can often go off track and experience great difficulty staying focused on their goals (Corno 1993). Once they realize from where they gain support, they can negotiate avenues of success with supportive assistance provided by the teacher. This interaction among teachers, students, and opportunities can be the link to eventual student self-regulation within a specific context (McCaslin and Good 1996). Help-seeking emphasizes that individuals' academic achievement can only be accomplished with accessible and available help providers.

In sum, in this chapter, we focus on social cognitive theory as an umbrella for the current case study with an emphasis on the importance of human agency and how learners acquire competencies, skills, dispositions, beliefs, and self-regulation. The theoretical framework and research of Bandura, Zimmerman, Corno, Winnie, Boekaerts, Pintrich, McCaslin, and Randi, among others, have informed and served and guided the current investigation. This chapter reports that self-regulated learning is one way in which aspiring teachers can be trained to become effective teaching professionals. The following chapter addresses the design of the case study and the methodology implemented to obtain data and holistically describes the setting in which the academic and teaching experience practices of four teacher candidates took place.

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